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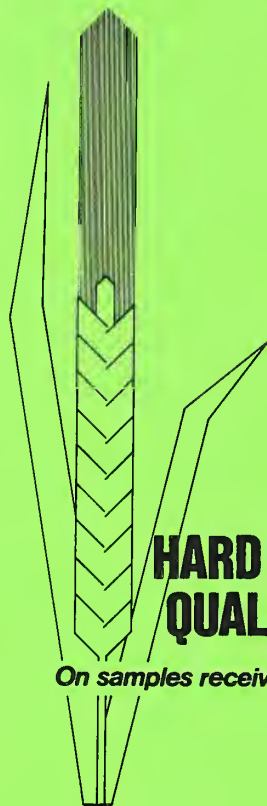
1981 CROP



HARD RED SPRING QUALITY REPORT

Physical, Chemical, Milling, and Baking Characteristics

United States Department of Agriculture
Agricultural Research Service
North Central Region



HARD RED SPRING QUALITY REPORT

On samples received from the 1981 crop

Source:

Spring and Durum Wheat Quality Laboratory
USDA, Agricultural Research Service
Cereal Chemistry & Technology, N.D.S.U.
Fargo, North Dakota 58105

REPORT OF PHYSICAL, CHEMICAL, MILLING AND BAKING
EXPERIMENTS WITH HARD RED SPRING WHEAT

1981 CROP1/

by

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<u>Contents</u>	<u>Page No.</u>
Cooperating Agencies	2
Introduction	3
Source of the Samples.	5
Table of Varieties and Crosses	7
Methods	8
Discussion	11
Uniform Regional Nursery Samples	16
Field Plot Nursery Samples	27
International Nursery	28
Explanation of Abbreviations, 1981 Crop	29
Tables - No. 1 through No. 10	
Reference Mixograms	

1/ This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. Cooperators submitting samples for analysis have been given analytical data on their samples prior to release of this report. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report was compiled by the Agricultural Research Service, U. S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies. The report is not intended for publication and should not be referred to in literature citations nor quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

2/ Hard Red Spring & Durum Wheat Quality Lab., NDSU.

3/ Dept. of Cereal Chemistry & Technology, NDSU.

1981 COOPERATING AGENCIES AND STATIONS

The cooperative agencies and stations conducting the varietal plot and nursery experiments from which the 1981 spring wheat samples were received are listed below:

Arizona Agricultural Experiment Station:

Mesa

University of California, Davis:

Imperial Valley

Minnesota Agricultural Experiment Station:

Crookston, Morris, St. Paul and Stephen

Montana Agricultural Experiment Station:

Sidney, Moccasin and Conrad

North Dakota Agricultural Experiment Station:

Carrington, Dickinson, Minot, Williston and Fargo

South Dakota Agricultural Experiment Station:

Brookings, Redfield and Selby

Washington Agricultural Experiment Station:

Pullman

Wisconsin Agricultural Experiment Station:

Madison

Wyoming Agricultural Experiment Station:

Sheridan

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by R. H. Busch, et al., Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1981.

INTRODUCTION

Samples of standard varieties and many of the new strains of hard red spring wheat grown in cooperative experiments in the spring wheat region of the United States^{4/} have been milled each year by the USDA. The flours were assayed chemically and physically and baked into bread to determine the quality characteristics. The purpose of this report is to make available to the cooperators, quality data on the standard varieties and new strains of hard red spring wheat from the 1981 crop.

The same general format and techniques were used in evaluating the wheat as outlined in quality reports for previous years. The data contained in this report are comparable to data in past reports and, where applicable, average results and also the average results of other crop years are compared. The area averages are tabulated for the Uniform Regional Nursery varieties of Butte, Era, Chris and Waldron. A four-year average (4-YA) and the averages for the individual four years include all selections grown in the Uniform Regional Nurseries for that year. These results give an overview of individual years and the influence of environment on the crop. The actual crop characteristics may be somewhat different due to differences in varieties, but the change from year to year is applicable.

The evaluation of a sample involves three areas of analysis: kernel characteristics, milling performance and baking evaluation. A brief description of the technique is given on pages 11 to 15 of this report. It is possible to deduce the various characteristics of the selection and any outstanding features or deficiencies which are apparent. No specific comments are made regarding the mixogram patterns, since reference mixograms for each of the general types are presented at the end of the report.

Seeding for the 1981 crop over the spring wheat area was a normal year with average rainfall. The average flour extraction was 0.5% lower than the 1980 crop and 0.5% lower than the 4 year average (YA). Wheat mineral content was slightly lower than the 1980 crop and also for the 4 year average. The wheat protein content was 0.2% lower than in

^{4/} Busch, R. H., and Cantrell, R. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1981. Agricultural Research Service, U. S. Department of Agriculture and State Agricultural Experiments Station, St. Paul, MN.

1980 but was equal to the 4 year average. The physical characteristics of the wheat were down somewhat from the 1980 crop and also the 4 year average. The bake absorption was 1.5% lower than the 1980 crop but equal to the 4 YA. Mix time was slightly longer for both the 1980 crop and the 4 YA. The loaf volume for the 1981 crop was lower than both the 1980 crop and the 4 YA. Oxidation requirements were unchanged.

SOURCE OF THE 1981 CROP SAMPLES

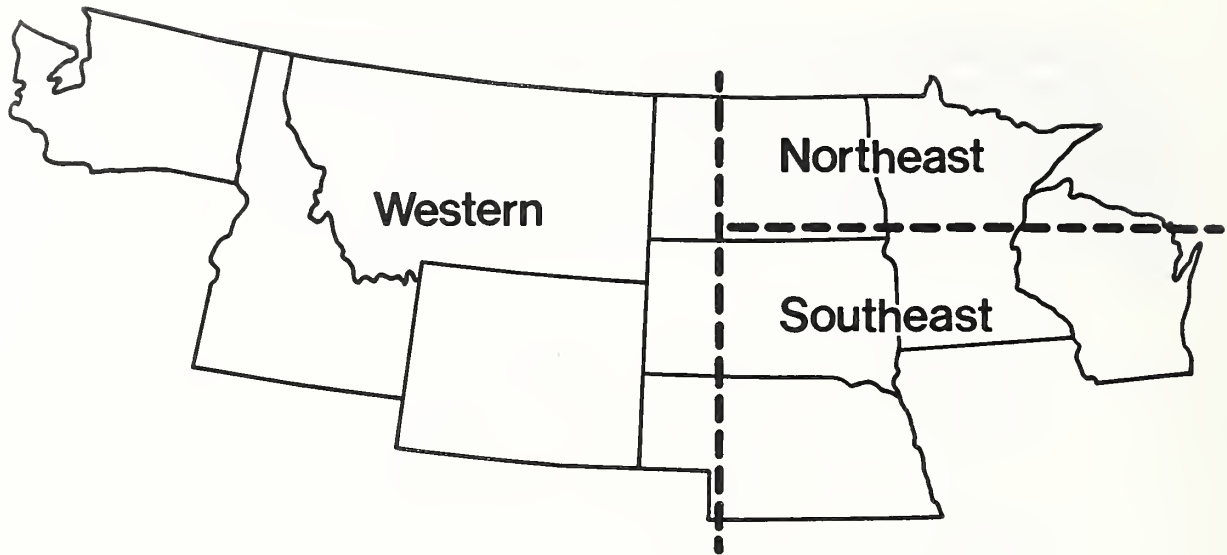
Tests were performed on 1,638 samples. However, data on 1,046 of these are not included in this report, because this information was of interest to plant breeders at specific experiment stations only. Data presented in this report are from the Field Plot Nursery, Uniform Regional Nursery, and the International Spring Wheat Nursery. The samples came from the 20 stations in nine states shown below:

Arizona: Mesa
California: Imperial Valley
Minnesota: Crookston, Morris, St. Paul and Stephen
Montana: Sidney, Moccasin and Conrad
North Dakota: Carrington, Dickinson, Minot,
Williston and Fargo
South Dakota: Brookings, Redfield and Selby
Washington: Pullman
Wisconsin: Madison
Wyoming: Sheridan

On page 7 are listed the spring wheats that were included in the Uniform Regional Nursery trials. The variety or cross, the station that developed the variety, the state selection number and the C.I. number are given.

BLENDING AND AVERAGING PROCEDURES USED

Individual wheat samples from the Uniform Regional Nursery originating from the three geographical areas shown in the illustration on page 6 were blended according to area. Sixteen of the 17 stations were compatible for blending. Milling performance, mixograms and baking data were obtained from these area blends. However, data for kernel characteristics are arithmetical averages of individual sample analyses. These data from the Uniform Regional Nursery also are compared with averages from the previous four years (Table 4).



Wheat blends were made according to the geographical areas shown above.

Data for the Field Plot Nursery and the International Nursery are on the individual samples.

THE UNIFORM REGIONAL HARD RED SPRING WHEAT PERFORMANCE NURSERY
The 30 entries in the 1981 URHRSWPN are listed below:

Entry No.	Cross or Variety	CI No. or Sel. No.	Year Entered	Source
1.	Marquis	3651	1929	Canada
2.	Chris	13751	1969	USDA-MN
3.	Waldron	13958	1964	ND
4.	Era	13986**	1972	USDA-MN
5.	Butte	17681	1979	ND
6.	Butte/James 's'	SD2868	1980	SD
7.	Eureka/Prodax	SD 2861**	1981	SD
8.	James/SD2049	SD2854	1981	SD
9.	SD2271/SD2167	SD2860**	1981	SD
10.	ND476/4/Sheridan/3/Nor 10/Bev. 14//4*Centana	MT7648**	1979	USDA-MT
1.	TzPP/Son64//Selkirk	MT7836**	1980	USDA-MT
2.	Borah/3/II-60-157/McCall//Moran	ID0162**	1981	USDA-ID
3.	Neepawa*6/RL4137	RL4352	1980	Mant.-Canada
4.	Crim/Era*2//Bui-Gallo	MN73168**	1979	USDA-MN
5.	Crim/Era*2//MN6923 's'	MN7357**	1980	USDA-MN
6.	Crim/Era*2//MN6923 's'	MN73167**	1981	USDA-MN
7.	ND562/Kitt	ND573	1980	ND
8.	Olaf/5/Jt/ND335//Pembina/3/Wanken* 2/4/Cis/Wisc 261	ND574**	1980	ND
9.	ND551//Butte*2/ND507	ND575	1980	ND
10.	ND551//Butte*2/ND507	ND581	1981	ND
1.	Butte*3/ND507	ND585	1981	ND
2.	Waldron/Era	NK75S2634**	1980	North. King
3.	Era/Justin	NK75S2631**	1980	North. King
4.		HS7664**	1980	N. Am. Pl. Br.
5.	Kitt/MN70170	HS79304**	1980	N. Am. Pl. Br.
6.	Kitt/MN7222	HS79348**	1981	N. Am. Pl. Br.
7.	TzPP/Son 64//Crim/3/Era (PR2360)	X6753**	1980	Pioneer
8.	TzPP/Son 64//Crim/3/Red River 68	X6718**	1980	Pioneer
9.	Wared/CI17689	WA6865**	1981	WA
10.	Borah/CI17689	WA6870**	1981	WA

*Semidwarf

METHODS

The terminology and methods used are briefly described below:

Test Weight Per Bushel - The weight per Winchester bushel of cleaned, dry, scoured wheat. To determine the dockage-free test weight on a comparable sample, approximately one pound per bushel should be subtracted from the value given.

1000 Kernel Weight - The 1000 kernel weight was determined by counting with a Seedburo seed counter the number of kernels in a 10 g sample of cleaned, picked wheat^{5/}.

Kernel Size - The percentages of the size of the kernels (large, medium and small) were determined on a wheat sizer as described by Shuey^{6/}.

The sieves of the sizer were clothed as follows:

Top Sieve - Tyler #7 with 2.92 mm opening
Middle Sieve - Tyler #9 with 2.24 mm opening
Bottom Sieve - Tyler #12 with 1.65 mm opening

Potential Yield - The potential yield is not shown on the computer tables, but it can be determined by multiplying the percentages of the overs of each sieve #7, #9 and #12 by the value of 78%, 73% and 68%, respectively. The accumulation percentage would be the potential yield.

Milling - The samples were cleaned by passing the wheat over an Emerson kicker and dockage tester and through a modified Forster scourer (Model 6). The clean, dry samples were pretempered to 12% moisture for at least 72 hours; then tempered to 16% moisture and allowed to stand overnight prior to milling.

5/ Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the U. S. Department of Agriculture, and does not imply its approval to the exclusion of other products that may also be suitable.

6/ Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5:71-72,75 (1960).

The Special Uniform Nursery and the International Spring Wheat Yield Nursery samples were milled on a Brabender Quadrumat Jr. mill. The mill was equipped with a #18 wire on the drum sieve. The troughs of the #18 wire were rebolted on a Strand sifter equipped with a #60 Tyler sieve. The sample was sifted for 1 minute. The troughs of the #60 wire classified as flour, and this was the material tested. The overs of the #18 wire were classified as bran, and the overs of the #60 Tyler sieve as crude shorts.

The Uniform Regional Nursery blends and the Field Plot Nursery samples were milled on a Buhler continuous experimental mill. This mill has been slightly modified to give results more comparable to commercial milling. The break scalping sieves were clothed with #54 stainless steel wire, the reduction scalping sieves with #58, #66 and #105 stainless steel wire for the first, second and third reduction, respectively. All of the flour sieves were clothed with #135 stainless steel wire.

All six flour streams were combined to give the patent flour. The extraction of a good milling wheat using this flow is approximately 68%. This is comparable to a commercial "long patent" extraction flour. At this flour extraction of the wheat, the changes in flour ash are most sensitive to changes in percent extraction.

Protein Content - The protein was calculated by multiplying the factor of 5.7 times the percent nitrogen as determined by the standard Kjeldahl procedure.

Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 565°C. The results were reported as percentage of the sample that was incinerated.

Mixogram - The mixogram was determined by using 30 g of flour and adding 20 cc of water. The sensitivity spring setting was set at 10. All mixograms were run with constant weight of flour and volume of water. Absorptions reported were adjusted according to the height of the mixogram. The correction factor was determined from a series of flours by varying the amount of absorption.

Mixogram Pattern - The reference mixogram patterns given at the end of the report demonstrate the different types of mixograms that were obtained. A single number is assigned each pattern to characterize and simplify the classification of the curves--the larger number indicating stronger curve characteristics.

Baking Procedure or Formula - The baking formula used was as follows:

100% flour	3% milk D.S.M.
2% salt	3% yeast
5% sugar	2% shortening (Crisco, melted)

The samples were mixed to development in National Manufacturing mixers: the macro mixer for the 25 g samples and the 100 g special mixer for the 100 g samples. Bromate (7.5 ppm) for oxidation and barley malt flour (0.1%) for enzymatic supplement were added to each sample. All doughs were moulded in a Roll-Er-Up moulder.

Absorption - The amount of water, expressed as percent of the flour, required to bring the dough to proper consistency.

Crumb Color - A value was determined by comparing the loaf of the tested sample against a baking standard. This standard was selected as an average for the crop year for the spring wheat area.

Loaf Volume - The volume of the baked loaf as determined by seed displacement.

All values (protein, ash and absorption) were reported on a 14% moisture basis.

DISCUSSION

The following discussion presents some of the basic techniques and criteria used in the milling and baking quality evaluation of the samples. There are four major evaluation categories used: kernel characteristics, to characterize the kernel; milling performance, to evaluate the general milling characteristics; mixogram patterns, to classify the flour as to type; and baking evaluation, to rate the flour as to overall baking.

Each evaluation category can be important. A sample could be of a sufficiently poor quality for a given category to suggest elimination from future testing. However, a sample submitted for the first time and found to be questionable should be tested again to establish if it has a satisfactory or unsatisfactory classification. A sample which is consistently rated as questionable should be discarded.

Six characteristics (test weight, 1000 kernel weight, percent large kernels, percent small kernels, wheat mineral and wheat protein) were independent variables used to calculate the dependent variable - kernel characteristics. Four characteristics (percent extraction, mineral @ 65% extraction, milling characteristic, and protein difference between flour and wheat protein) were used to calculate the dependent variable - milling performance. Bake absorption, mixing time, dough characteristics, crumb color, crumb grain and loaf volume were the six independent variables used to determine the dependent variable - baking evaluation. These three dependent variables after calculation become independent variables used to calculate the dependent variable - General Evaluation.

The three dependent variables, kernel characteristics, milling performance and baking evaluation are rated on a scale of 1 to 8, with 1 being very satisfactory and 8 being unsatisfactory. The general evaluation is rated on a scale of 1 to 4, with 1 being no promise; 2, little promise; 3, some promise; and 4, good promise. If one of the independent variable's converted value is 8 (with the exception of crumb color), this automatically will rate the general evaluation as 1, or no promise. If there are no 8's, the three values are employed in a regression equation to derive the general evaluation. The weighted value for each of these variables on the general evaluation is approximately 6% for kernel characteristics, 47% for milling performance and 47% for baking evaluation.

To quickly point out problem areas for a selection, two additional columns appear on the printout. One column is minor deficiencies in which the independent variables, converted to a 5 or a 6 (i.e., questionable or questionable to unsatisfactory) will appear. The second column is major deficiencies in which the independent variables were converted either to a 7 or an 8 (i.e. unsatisfactory to questionable and unsatisfactory). Deficiencies of the various selections may be readily determined by scanning these columns. It is also possible to have one or two independent variables that would appear in the major deficiency column, rating 7. These characteristics should be given serious consideration even though they do not influence the general rating sufficiently to rank the selection as having no promise.

All samples, as in previous years, are compared with a milling and baking standard that represents a blend of the crop year blended to a known quality. However, the samples for the individual stations are evaluated against the average results of the check varieties from the respective stations. The agronomic and climatic conditions of the individual locations can affect the quality of the wheat sample, such that the evaluation at certain locations could have all samples--even the named varieties--classified as questionable to unsatisfactory. Therefore, the evaluation ratings of one station are not directly comparable with those of another station. For example, an area may produce low protein wheats which give large and plump kernels, good milling and kernel characteristics, but low protein and unsatisfactory baking properties such as short mixing time, low loaf volume and weak dough characteristics. The wheat from this area could not be considered as a strong spring wheat and would not maintain the quality expected from the spring wheat producing area. A good variety should have tolerance to a wide range of environmental conditions and the overall picture should be taken into consideration for establishing these varieties.

Kernel Characteristics are important in determining the initial value of the wheat and, if extremely poor, could disqualify a new variety from further consideration. Because of the present grading system, it is desirable to have a good test weight. If a sample has a low 1000 kernel weight and small kernel size distribution, it would be considered a poor sample for milling because of the high ratio of bran to endosperm. Therefore, it is desirable to have plump kernels. Wheat ash is an important factor when comparing a variety against other standard varieties. If a sample consistently has higher wheat mineral content, it increases the probability of having high flour ash. Lower

protein than the standard varieties is not desirable, because in a low protein crop year the probability of it having such a low protein as to be undesirable is much greater. Therefore, the protein must also be considered as a characteristic when comparing varieties grown in the same locality.

Milling Performance is very important, especially the subcategory of milling characteristics. If low extraction or high flour ash is obtained, these become major factors which are quite unacceptable from a commercial milling standpoint. All flour mineral contents are reported at a constant extraction of 65%, so that the figures are directly comparable. As a rule of thumb, one can approximate that each point of ash (0.01%) is equivalent to approximately 2% in extraction.

Milling characteristics are important. A sample which tends to be soft in character requires a different milling technique to be milled properly. On commercial mills flowed for hard vitreous spring wheats, soft milling characteristics cause great difficulty. Therefore, if a sample shows softness in character, it is considered to be unsatisfactory. Likewise, a sample which is extremely hard and vitreous will cause difficulty. Both types of wheat (soft and vitreous) require different roll pressures, clothing, sifter surface and temper to be milled properly. If these wheats are blended with normal milling wheats, improper results are obtained since these characteristics are not necessarily compatible or additive. Normal to soft score indicates that the sample shows a tendency toward softness of character on the flour mill stocks and extraction. This would indicate that the sample may give some difficulty for certain mill streams, and an adjustment would either have to be made in the milling flow or in tempering procedures to compensate for these differences. The properties of this wheat may or may not be compatible with other wheats with which it may be blended; therefore, it is important to maintain varieties with milling characteristics as uniform as possible.

The amount of protein recovered in the flour for a sample is of importance. High protein wheats yielding low protein flours are not desirable. Such a wheat would have much of the protein distributed in the outer portion of the kernel which would result in excessive protein in the feed. Therefore, higher wheat protein would be necessary to yield a flour with protein content comparable to that of a wheat that gives good flour protein recovery.

Mixogram Patterns and Farinogram Patterns are important in estimating the strength and mixing tolerance or potential mixing tolerance of a flour. A long, flat curve is more desirable than a short, peaked curve; however, an extremely long curve may be undesirable, if the flour would require excessive mixing for proper development. Both the pattern and length of the curve are important, and both must be considered. Abnormal curves, such as sway-back or long initial time to incorporate the water, indicate undesirable characteristics.

Baking Evaluation takes into account the flour absorption, mixing time, dough characteristics, loaf volume and machinability. A sample which has low absorption would be unsatisfactory. A sample with extremely short mixing time would also be considered undesirable as a good strong spring wheat. When a sample is in the minimal range for these values, it is considered to be questionable until further testing demonstrates whether a definite deficiency exists.

Doughs having mellow to weak dough properties show a tendency towards weakness. Also, for mellow to strong, the dough is mellow but has a tendency to be strong, and a strong to mellow dough is just the reverse. Since these characteristics are subjective rather than objective, it is necessary at times to estimate the tendency; therefore, the necessity exists for apparent double grades.

The grain or appearance of the interior of the loaf shows how well the sample stood up during baking and may point out or explain some deficiencies which have been observed during the baking test.

Loaf volume indicates potential strength of the flour in a different manner than mixing time or dough characteristics in that it shows the ability or lack thereof for the dough to expand under pressure and to contain the entrapped gases during this expansion. Weak flours act much like rotten balloons, which burst when blown up and collapse and yield low loaf volume or extremely large volume and large holes in the interior of the loaf. Low protein flours and lifeless (dead) doughs exhibit properties similar to putty and do not expand during fermentation or baking and give low loaf volume. Tough and very bucky doughs are bound too tightly and impede expansion of the gases causing low loaf volume.

General Evaluation rating applies only to the data contained in the year of the report. A new category, the Prospect of a selection, will apply to two or more years of data. The Prospect is given for each selection that has been tested for at least two crop years. This evaluation

takes into account the various grading factors and the results of the crop years in an effort to determine if the selection should be considered as a prospective new variety. The main defects and outstanding features are discussed. A selection which is promising should be continued. Those which show some promise with outstanding agronomic characteristics should be seriously considered and looked at in large plots (if it has not been done previously), providing sufficient other information has been obtained. A sample which shows little or no promise should be discontinued.

UNIFORM REGIONAL NURSERY SAMPLES - 1981 CROP

Discussion of Area Blends

A total of 498 Uniform Regional Nursery samples were received. The samples were from 16 stations in 7 states. Wheat blends were made of the samples for this crop year by area. The areas tend to represent movement of the wheat in the market. Kernel characteristics were determined on individual samples to eliminate possible erroneous results. The area blends were then milled and baked by our macro method. Thirty samples were received from each of the 16 stations. Twenty-five selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were commercially named varieties, namely, Butte, Chris, Era, Marquis and Waldron.

Data from the northeast area blend are given in Table 1. The four stations included in this blend were Carrington, Fargo and Minot, North Dakota and Crookston, Minnesota.

The data for the southeast area blend are given in Table 2. The six stations included in this blend were Morris and St. Paul, Minnesota; Brookings, Redfield and Selby, South Dakota; and Madison, Wisconsin.

The data for the western area blend are given in Table 3. The six stations included in this blend were Sidney, Moccasin, and Conrad, Montana; Dickinson, North Dakota; Sheridan, Wyoming; and Pullman, Washington. Williston, North Dakota samples were not included in the area blend, because we received only 18 of the 30 necessary for an equal blend. These samples were processed individually, and the data are reported in Table 6.

Discussion of Area and Crop Year Averages

In Table 4 are given the average area results for the combined data of the varieties, Butte, Chris, Era and Waldron samples submitted from the 7 states and 16 stations. The area average represents all samples that were grown in that area for the year cited.

The milling and baking results were obtained from the area blend of the wheats in equal proportions from each of the stations for the respective variety or selection. The regular 100 g straight dough rich formula baking procedure was used in baking. The General Evaluation column includes the overall performance of the blend of each sample. The general evaluation given for the sample area blend may not agree with that of the individual wheat samples within the blend, since averages do not express the range, and poor characteristics may be masked. In an endeavor to clarify this problem, the average general evaluation, the number of total deficiencies and the number of major deficiencies are shown in parenthesis after each variety or selection -- (Average General Evaluation - #Total Deficiencies/#Major Deficiencies).

For simplicity and brevity, as in previous reports, each selection or variety will be discussed from the general viewpoint rather than the individual areas. General Evaluation summarizes the results from the individual areas for one crop year. The evaluation is more meaningful for the overall performance of a variety or selection, when at least two or more crop years are included. Data discussed under the category, The Prospect, includes two or more years.

Also given in Table 4 are comparisons of the previous four crop years, which include all selections grown in the Uniform Regional Nursery for that year, as well as the 4 YA. 1981 crop kernel characteristics (test weight and 1000 kernel weight) were down slightly from the 4 YA. The wheat and flour protein content were the same. Milling extraction was down 0.5% from the 4 YA. Bake absorption was equal to the 4 YA; mixing time was three-fourths minute longer than the 4 YA. Dough characteristics were equal; the crumb grain down slightly and the loaf volume was also down from the 4 YA.

A comparison of the 1981 and 1980 crop results shows the 1980 crop to be slightly better than the 1981 crop. In 1980 the test weight was up 0.5 lbs., 1000 KW up slightly, wheat protein up 0.2%, flour extraction up 0.5%, bake absorption up 1.5%, mix time one-half minute shorter, dough equal, crumb color equal, crumb grain slightly better, and loaf volume higher.

Discussion of Individual Varieties or Selections

Average results of the varieties Butte, Chris and Waldron for each of the individual areas were used as stan-

dards for the other selections from that area; therefore, a variety or selection may be rated satisfactory in two different areas, but comparison of the data may show much poorer results for one area due to adverse environmental conditions. Thus the sample with poor results could be rated as having unsatisfactory quality when compared with the overall spring wheat area, even though it may be rated as showing good promise for one area.

By using the same format as used in previous years and employment of the computer, all named varieties receive a general evaluation. Only those varieties in the "Good Promise" category could be consistently considered as acceptable to the trade both in the domestic, as well as foreign markets. Data for the named varieties of Butte, Chris, Era, Marquis and Waldron will be an average of each variety for the last three years.

<u>Butte</u>	(3.8 - 2/0)*	- Good Promise
<u>Chris</u>	(3.9 - 15/0)	- Good Promise
<u>Era</u>	(1.8 - 27/14)	- Little Promise
<u>Marquis</u>	(2.0 - 28/7)	- Little Promise
<u>Waldron</u>	(3.0 - 10/2)	- Some Promise

HS 7664 (1.0 - 25/11) (2 yrs.)

Kernel Characteristics - Questionable to unsatisfactory.
Tendency toward low protein and test weight.

Milling Performance - Satisfactory.

Baking Evaluation - Unsatisfactory. Long mix time, low absorption, and low loaf volume.

General Evaluation - No promise

HS 79304 (1.7 - 8/4) (1 yr.)

Kernel Characteristics - Questionable. Low protein and test weight.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to unsatisfactory.
Tendency toward low bake absorption and loaf volume.

General Evaluation - Little promise.

* (Average General Evaluation - #Total Deficiencies/Major Deficiencies.)

HS 79348 (1.7 - 14/7) (1 yr.)

Kernel Characteristics - Questionable to unsatisfactory.
Low test weight, small kernels and low wheat protein.

Milling Performance - Satisfactory to questionable.
Tendency toward high flour mineral content at 65% extraction.

Baking Evaluation - Questionable to unsatisfactory.
Tendency to have low bake absorption.

General Evaluation - Little promise.

ID 0162 (1.7 - 18/5) (1 yr.)

Kernel Characteristics - Unsatisfactory to questionable.
Low test weight and small kernel size.

Milling Performance - Satisfactory to questionable. Low wheat protein.

Baking Evaluation - Unsatisfactory to questionable.
Long mix time, tough dough, and low bake absorption.

General Evaluation - Little promise.

MN 7357 (2.2 - 21/6) (2 yrs.)

Kernel Characteristics - Unsatisfactory to questionable.
Low test weight and wheat protein.

Milling Performance - Satisfactory to questionable.
High flour mineral at 65% extraction.

Baking Evaluation - Questionable to unsatisfactory.
Long mix time, tough dough, and slightly lower bake absorption.

General Evaluation - Little promise.

MN 73167 (3.0 - 8/2) (1 yr.)

Kernel Characteristics - Questionable. Low wheat protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory, although it does have a tendency to have a long mix time and a slightly lower bake absorption.

MN 73167 (Cont'd)

General Evaluation - Some promise.

MN 73168 (2.0 - 33/9) (3 yrs.)

Kernel Characteristics - Questionable to unsatisfactory.
Low test weight and wheat protein content.

Milling Performance - Satisfactory to questionable.
High mineral content at 65% extraction.

Baking Evaluation - Questionable. Very strong dough and slightly lower bake absorption.

General Evaluation - Little promise.

MT 7648 (1.7 - 47/10) (3 yrs.)

Kernel Characteristics - Questionable. Low 1000 kernel weight, tendency toward low percentage large kernels, high percentage small kernels.

Milling Performance - Satisfactory to questionable.
Slightly higher mineral content at 65% extraction.

Baking Evaluation - Questionable to unsatisfactory.
Long mix time, slightly lower bake absorption.

General Evaluation - Little promise.

MT 7836 (2.5 - 24/2) (2 yrs.)

Kernel Characteristics - Questionable to satisfactory.
Tendency toward low test weight, slightly lower wheat protein.

Milling Performance - Satisfactory. May have a tendency toward high mineral content at 65% extraction.

Baking Evaluation - Questionable to satisfactory. Long mix time and tough dough.

General Evaluation - Little promise.

ND 573 (3.2 - 6/1) (2 yrs.)

Kernel Characteristics - Satisfactory, although one area shows lower wheat protein.

Milling Performance - Satisfactory. Slightly higher mineral content at 65% extraction.

ND 573 (Cont'd)

Baking Evaluation - Satisfactory to questionable. Tough dough.

General Evaluation - Some promise.

ND 574 (3.2 - 5/0) (2 yrs.)

Kernel Characteristics - Satisfactory. However, the test weight is down an average of 2.5 lb. from Butte.

Milling Performance - Questionable to satisfactory. Flour extraction down slightly, high mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Some promise.

ND 575 (3.2 - 10/1) (2 yrs.)

Kernel Characteristics - Satisfactory to questionable. Low test weight and wheat protein content.

Milling Performance - Satisfactory to questionable. High mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Some promise.

ND 581 (2.0 - 5/2) (1 yr.)

Kernel Characteristics - Satisfactory. However, the test weight is slightly low, and protein content is lower in one area.

Milling Performance - Questionable to unsatisfactory. High mineral content at 65% extraction.

Baking Evaluation - Satisfactory. However, the mix time tends to be long.

General Evaluation - Little promise.

ND 585 (3.7 - 2/0) (1 yr.)

Kernel Characteristics - Satisfactory to questionable. Fewer large kernels.

ND 585 (Cont'd)

Milling Performance - Satisfactory to questionable.
High mineral content at 65% extraction.

Baking Evaluation - Satisfactory. Slightly lower loaf volume.

General Evaluation - Good promise.

NK 75S2631 (1.2 - 21/10) (2 yrs.)

Kernel Characteristics - Questionable to unsatisfactory.
Tendency toward lower protein content. Test weight slightly low.

Milling Performance - Unsatisfactory to questionable.
High mineral content at 65% extraction.

Baking Evaluation - Questionable. Lower loaf volume.
Long mix time.

General Evaluation - No promise.

NK 75S2634 (1.8 - 16/8) (2 yrs.)

Kernel Characteristics - Questionable to unsatisfactory.
Low protein content.

Milling Performance - Questionable to satisfactory.
High mineral content at 65% extraction.

Baking Evaluation - Satisfactory; however, the loaf volume is low from one area.

General Evaluation - Little promise.

RL 4352 (2.7 - 8/3) (2 yrs.)

Kernel Characteristics - Satisfactory. However, it has a tendency to have high mineral content.

Milling Performance - Questionable to satisfactory.
High mineral content at 65% extraction.

Baking Evaluation - Satisfactory; however, the crumb grain is down slightly.

General Evaluation - Some promise.

SD 2854 (3.7 - 5/0) (1 yr.)

Kernel Characteristics - Satisfactory to questionable.
Low test weight.

Milling Performance - Satisfactory; however, it does show slightly higher mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Good promise.

SD 2860 (3.3 - 9/0) (1 yr.)

Kernel Characteristics - Questionable to satisfactory.
Low percentage of large kernels and high wheat mineral content.

Milling Performance - Satisfactory to questionable.
High mineral content at 65% extraction. Also a drop in protein content.

Baking Evaluation - Satisfactory.

General Evaluation - Some promise.

SD 2861 (2.3 - 8/2) (1 yr.)

Kernel Characteristics - Questionable. Low protein content, high wheat mineral.

Milling Performance - Questionable. High mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Little promise.

SD 2868 (3.5 - 6/0) (2 yrs.)

Kernel Characteristics - Satisfactory to questionable.
Low percentage of large kernels.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory.

General Evaluation - Good promise.

WA 6865 (2.3 - 16/1) (1 yr.)

Kernel Characteristics - Questionable. Low test weight.

Milling Performance - Satisfactory to questionable.
High mineral content at 65% extraction; also two areas had slightly lower flour extraction.

Baking Evaluation - Questionable to satisfactory. Tough dough and slightly longer mix time.

General Evaluation - Little promise.

WA 6870 (3.0 - 13/1) (1 yr.)

Kernel Characteristics - Questionable to unsatisfactory.
Low test weight, slightly lower protein content, larger percentage of small kernels, and tendency toward high wheat mineral content.

Milling Performance - Satisfactory to questionable.
High mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Some promise.

X 6718 (1.7 - 26/4) (2 yrs.)

Kernel Characteristics - Questionable to satisfactory.
Slightly lower test weight, large percentage of small kernels, slightly higher wheat mineral, and lower protein.

Milling Performance - Questionable to satisfactory.
Tendency toward high mineral content at 65% extraction.

Baking Evaluation - Questionable to unsatisfactory.
Very long mix time, tough dough.

General Evaluation - Little promise.

X 6753 (1.8 - 30/6) (2 yrs.)

Kernel Characteristics - Questionable to unsatisfactory.
Low percentage of large kernels, low protein content, and slightly lower test weight.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to unsatisfactory.
Long mix time, tough dough, and lower loaf volume.

X 6753 (Cont'd)

General Evaluation - Little promise.

1981 UNIFORM REGIONAL HARD RED SPRING WHEAT
NURSERY SAMPLES NOT INCLUDED
IN THE AREA BLENDS

SHERIDAN, WYOMING

The 1981 milling and baking standard was used as the standard. The three selections showed no promise. The data for these samples are given in Table 5.

PULLMAN, WASHINGTON

The 1981 milling and baking standard was used as the standard. The three selections showed no promise. There was not enough sample from WA 6823 to bake. The data for these samples are given in Table 5.

BROOKINGS, SOUTH DAKOTA

The 1981 milling and baking standard was used as the standard. The two selections showed no promise. The data for these samples are given in Table 5.

CARRINGTON, NORTH DAKOTA (Irrig.)

Only one selection from this station was not used in the area blend. Again, the 1981 milling and baking standard was used as the standard. The selection showed no promise. The data for this sample are given in Table 5.

WILLISTON, NORTH DAKOTA

All samples from this station had low test weights and a large percentage of small kernels, which had an effect on flour extraction. Only one selection showed good promise. Data for these samples are given in Table 6.

FIELD PLOT NURSERY SAMPLES - 1981 CROP

Eighty-five samples were received from three states. The data for the individual samples are given in Tables 7, 8, and 9.

IMPERIAL VALLEY, CALIFORNIA

Twenty-seven samples were received. Six of the samples were named varieties. In Table 7 Oslo was used as the standard.

MESA, ARIZONA

Twenty samples were received from this station. Of these 13 were named varieties. In Table 8 Oslo was used as the standard.

WILLISTON, NORTH DAKOTA

Thirty-eight samples were received from the Williston station. Twenty-four of the samples were named varieties. Standards used were Butte, Olaf, and Waldron. Data for these samples are given in Table 9.

INTERNATIONAL NURSERY SAMPLES - 1981 CROP

Nine samples were received from the St. Paul station. Era was used as the standard. All of the selections showed no promise. Major faulting factors for all the selections were flour extraction, which ranged from 3.7% to 10.0% less than the standard and mineral at 65% extraction. This data is given in Table 10.

EXPLANATION OF ABBREVIATIONS LISTED UNDER THE
HEADINGS AND THOSE THAT MAY BE LISTED UNDER
MINOR AND MAJOR DEFICIENCIES ON COMPUTER PRINTOUT

TW = Test Weight
KW = 1000 Kernel Weight
LG = Large Kernels
MD = Medium Kernels
SM = Small Kernels

WM = Wheat Mineral
WP = Wheat Protein
KERN CHAR = Kernel Characteristics
EX = Flour Extraction
M65 = Mineral at 65% Flour Extraction

FLR. PRO = Flour Protein
PD = Protein Drop Between Flour and Wheat
MLG. CHAR = Milling Characteristics
MLG. PER = Milling Performance
MIX. ABS = Mixograph Absorption

MIX. PAT = Mixograph Pattern Score
BAKE. ABS. = Actual Bake Absorption
BA = Bake Absorption
MIX TIME = Actual Dough Mixing Requirements
MT = Mix Time

DOUGH CHAR = Dough Handling Characteristics
DO = Dough Characteristics
CRUMB COLOR = Example - 100.5
100 = score received for color
.5 = creamy-the characteristic
of that particular loaf.

CRUMB GRAIN = Example - 86.05
86 = score received for crumb
grain.
.05 = open-or characteristic of
that loaf's crumb grain.

LOAF VOL = Actual Loaf Volume
LV = Loaf Volume
BAKE EVAL = Bake Evaluation
GEN. EVAL = General Evaluation

TABLE 1

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	LG KERN.	SIZE SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN. @ 65% EX.	FLR. PRO.	MLG. CHAR.	MLG. PER.	MIX. ABS.	MIX. PAT.
		G.	%	%	%	%	%	%	%	%	%	%	%	%
NORTHEASTERN AREA														
BUTTE	61.3	30.3	29	69	1.63	15.4	2	71.1	0.35	14.6	1	2	65.0	5
CHRIS	59.1	25.5	10	85	1.64	16.0	4	70.4	0.37	15.6	1	2	64.2	5
ERA	59.0	26.6	14	80	1.70	14.1	6	71.9	0.41	13.4	1	4	63.5	6
MARQUIS	59.4	26.4	10	85	1.80	15.1	5	70.1	0.42	14.6	1	5	63.5	4
WALDRON	57.5	30.1	27	70	1.78	16.1	3	69.7	0.42	15.3	1	5	65.0	6
HS 7664	57.0	30.9	30	66	1.72	14.2	6	71.6	0.41	13.5	1	4	61.0	7
HS 79304	58.0	29.6	24	72	1.68	14.2	6	71.6	0.41	13.4	1	4	61.0	7
HS 79348	55.5	25.8	18	76	1.77	14.9	6	70.7	0.43	14.1	1	8	63.2	7
ID 0162	56.4	26.8	17	82	1.78	14.2	7	69.5	0.41	13.9	1	5	61.9	10
MN 7357	57.0	29.3	18	77	1.67	14.2	7	71.7	0.40	13.3	1	5	62.3	9
MN 73167	58.3	31.1	23	73	1.62	14.3	6	72.7	0.40	13.4	1	5	63.5	8
MN 73168	56.8	28.9	21	73	1.71	14.2	6	71.5	0.42	13.3	1	5	62.5	8
MT 7648	56.9	24.2	7	80	1.77	15.5	5	68.3	0.42	15.2	1	6	61.9	11
MT 7836	57.0	28.5	16	78	1.73	15.0	5	70.0	0.39	14.3	1	3	64.2	9
ND 573	61.4	30.1	25	73	1.65	15.4	2	69.6	0.36	14.6	1	2	65.7	6
ND 574	57.9	30.3	33	65	1.75	15.6	2	67.5	0.39	14.5	1	4	64.4	6
ND 575	59.6	34.8	48	50	1.68	14.9	4	68.7	0.39	13.9	1	3	64.7	6
ND 581	60.6	33.6	43	55	1.66	15.6	2	67.8	0.43	14.5	1	8	63.2	7
ND 585	59.4	30.6	29	69	1.61	15.6	2	69.0	0.38	14.7	1	3	64.5	7
NK 755 2631	57.8	27.4	19	75	1.71	14.4	6	68.7	0.47	13.5	1	8	64.7	5
NK 755 2634	57.8	26.2	17	77	1.73	14.0	7	70.8	0.45	13.1	1	8	65.0	7
RL 4352	59.5	24.5	28	68	1.73	16.4	2	69.6	0.42	15.5	1	5	66.3	5
SD 2854	57.3	29.6	21	74	1.74	15.5	3	69.4	0.36	14.8	1	5	65.7	6
SD 2860	57.3	25.5	9	84	1.76	15.5	4	69.2	0.41	14.7	1	5	65.7	7
SD 2861	56.5	30.9	19	76	1.75	14.5	6	67.7	0.44	13.7	1	8	63.8	7
SD 2868	60.0	27.9	13	82	1.64	15.0	5	70.5	0.34	14.3	1	2	63.3	5
WA 6865	57.0	26.3	15	86	1.84	15.7	8	69.9	0.39	15.1	1	3	65.3	8
WA 6870	55.4	27.8	16	76	1.90	15.0	7	69.7	0.41	14.6	1	4	62.8	5
X 6718	56.9	29.1	14	78	1.74	15.0	6	69.9	0.44	14.4	1	8	62.3	11
X 6753	57.8	25.6	10	82	1.79	14.4	7	71.9	0.37	13.7	1	2	62.3	9

TABLE 1 (Cont.)

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

1981 CRCP

VARIETY OR SEL. NO.	BAKE ABS. 2/	MIX. TIME 6/	DOUGH CHAR. 6/	CRUMB COLOR 7/	CRUMB GRAIN 8/	LOAF VOL. 9/	BAKE EVAL. 3/	GEN. EVAL. 9/	MINOR DEFICIENCY	MAJOR DEFICIENCY
	MIN.					CC.				
NORTHEASTERN AREA										
BUTTE	65.7	4.00	3	100.0	88.09	980	2	4		
CHRIS	64.8	4.00	3	102.0	87.07	980	2	4		
ERA	64.9	5.50	3	102.0	87.09	970	2	3		
MARQUIS	64.9	4.25	4	100.0	90.99	935	4	2	WM DO	WP M65
WALDRON	66.6	4.25	3	100.0	88.09	1000	2	3		
HS 7664	62.4	5.75	3	101.0	89.99	905	8	1	TW M65 LV	WP BA
HS 79304	63.8	4.75	3	102.5	87.05	930	5	2	M65 BA	WP
HS 79348	64.4	6.00	3	101.7	88.09	975	4	1	TW WP BA	TW M65
ID 0162	63.3	6.75	2	100.0	88.07	1005	8	1	TW SM WP	LG BA
MN 7357	63.5	6.75	2	102.0	86.09	965	8	1	TW M65 MT DO	WP BA
MN 73167	64.9	6.00	3	102.5	87.05	990	2	3	M65	WP M65
MN 73168	63.7	6.00	2	101.0	90.99	930	6	1	TW BA DO	WP
MT 7648	63.8	8.00	3	101.0	88.09	1040	5	1	TW KW BA	LG SM
MT 7836	65.7	7.00	2	100.0	89.99	1000	5	2	TW WP MT DO	
ND 573	67.1	4.25	2	101.0	88.09	970	4	3	DO	
ND 574	65.5	5.00	3	102.0	88.07	945	2	3	EX	
ND 575	65.9	4.50	3	102.7	87.09	975	2	4	WP	M65
ND 581	69.8	5.50	3	100.0	86.09	985	2	1		
ND 585	69.9	4.50	3	100.0	86.05	945	2	4		
NK 755 2631	66.3	4.75	4	103.0	86.07	925	5	1	TW WP DO	M65
NK 755 2634	66.8	5.25	3	101.0	88.09	975	2	1	TW KW	WP M65
RL 4352	68.4	4.50	3	102.0	87.05	1015	2	3		
SD 2854	67.6	4.75	3	101.7	87.05	1005	2	4	TW	M65
SD 2860	67.8	6.00	3	101.0	86.05	965	2	3	TW KW LG SM	
SD 2861	66.0	4.75	3	101.5	88.09	955	2	1	TW WP	M65
SD 2868	65.9	4.50	3	102.0	88.09	975	2	4	LG WP	
WA 6865	67.2	5.50	2	104.0	86.05	1015	4	1	TW KW SM WM DO	LG
WA 6870	64.4	4.00	3	101.8	87.09	960	4	2	SM WM WP M65 BA	TW
X 6718	64.2	7.00	2	103.8	85.07	990	7	1	TW LG SM WP	M65
X 6753	63.8	7.00	2	103.8	87.09	930	8	1	TW KW LG SM WM WP BA MT	

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY. XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN. XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 2

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	KERNEL SIZE			WHT. MIN. 2/	WHT. PRO. 2/	KERN. CHAR. 3/	FLR.		MIN. @ 65% EX. 2/	FLR. PRO. 4/	MLG. CHAR. 3/	MLG. PER. 3/	MIX. ARS.		MIX. PAT. 5/
			LG	MED	SM				EXT.	PRO.					2/	5/	
SOUTHEASTERN AREA																	
BUTTE CHRIS ERA MARQUIS WALDRON	62.0	33.9	44	54	2	1.71	14.3	2	71.4	0.37	13.4	1	1	1	62.8	4	4
	60.4	29.2	18	79	3	1.76	15.0	3	69.9	0.39	14.3	1	2	2	61.6	3	3
	60.1	29.9	26	70	4	1.67	12.6	8	71.7	0.40	11.6	1	1	1	58.1	4	4
	57.7	29.5	20	75	5	1.79	13.4	8	70.1	0.52	12.7	1	1	1	61.9	4	4
	59.4	33.6	44	53	3	1.86	15.1	3	69.4	0.44	13.9	1	1	1	63.2	6	6
HS 7664 HS 79304 HS 79348 ID 0162 MN 7357	58.4	33.0	39	58	3	1.76	12.8	8	70.6	0.40	12.0	1	1	1	59.0	7	7
	59.2	31.3	38	59	3	1.70	13.2	6	70.4	0.41	12.2	1	1	1	59.3	6	6
	56.8	29.8	31	64	5	1.72	13.3	7	69.4	0.42	12.3	1	1	1	59.7	5	5
	58.8	31.9	19	76	5	1.80	13.1	7	69.7	0.41	12.3	1	1	1	58.3	11	11
	59.2	34.3	44	53	3	1.67	13.2	6	70.9	0.41	12.3	1	1	1	60.7	6	6
MN 73167 MN 73168 MT 7648 MT 7836 ND 573	60.2	36.5	48	49	3	1.64	13.2	5	70.7	0.39	12.1	1	1	1	61.0	5	5
	59.8	34.3	43	54	3	1.65	13.0	5	71.4	0.41	12.1	1	1	1	61.0	6	6
	59.7	28.2	14	81	5	1.83	13.7	7	68.2	0.40	13.1	1	1	1	61.9	11	11
	58.6	31.3	24	71	5	1.79	13.6	7	68.3	0.40	13.0	1	1	1	63.2	8	8
	60.9	31.2	36	62	2	1.80	13.9	4	69.1	0.39	13.1	1	1	1	65.0	6	6
ND 574 ND 575 ND 581 ND 585 NK 755 2631	59.5	34.5	50	48	2	1.50	14.3	2	69.0	0.42	13.1	1	1	1	66.3	6	6
	60.3	34.7	43	54	3	1.77	13.9	4	69.0	0.41	13.0	1	1	1	66.3	6	6
	60.8	35.2	48	50	2	1.71	13.9	4	69.7	0.42	12.7	1	1	1	67.7	7	7
	60.5	34.2	42	56	2	1.74	14.1	3	68.8	0.41	13.3	1	1	1	67.6	6	6
	59.5	31.7	36	60	4	1.71	12.7	8	69.6	0.46	11.6	1	1	1	62.5	5	5
NK 755 2634 RL 4352 SD 2854 SD 2860 SD 2861	60.1	30.8	37	59	4	1.70	12.6	8	71.4	0.41	11.5	1	1	1	62.5	5	5
	59.2	30.2	34	62	4	1.80	14.9	3	69.7	0.44	14.0	1	1	1	65.0	6	6
	59.0	32.5	30	67	3	1.76	14.5	3	69.3	0.40	13.7	1	1	1	64.4	5	5
	59.5	29.9	20	75	5	1.85	14.3	4	70.0	0.41	12.9	1	1	1	67.9	7	7
	59.7	38.0	51	46	3	1.77	14.0	4	68.7	0.42	13.1	1	1	1	65.7	6	6
SD 2868 WA 6865 WA 6870 X 6718 X 6753	61.9	33.2	32	65	3	1.79	14.2	4	70.6	0.36	13.3	1	1	1	65.3	5	5
	58.6	28.2	18	77	5	1.85	14.6	4	68.8	0.40	13.8	1	1	1	67.9	7	7
	58.2	32.3	27	68	5	1.83	13.7	6	70.4	0.39	12.9	1	1	1	65.7	5	5
	59.7	32.7	25	70	5	1.73	13.7	6	70.8	0.42	13.0	0	0	0	67.0	10	10
	60.7	29.8	21	75	4	1.75	13.0	7	72.2	0.37	12.1	1	1	1	64.2	7	7

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

1981 CRCP

VARIETY OR SEL. NO.	BAKE ABS. %	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL. CC.	BAKE FVAL. %	GEN. EVAL.	MINOR DEFICIENCY				MAJOR DEFICIENCY	
									9/	9/	9/	9/		
SOUTHEASTERN AREA														
BUTTE	64.7	3.00	3	100.0	87.99	925	2	4						
CHRIS	61.1	4.00	3	102.0	89.10	985	4	3						
ERA	60.1	4.00	4	103.8	91.99	900	8	1						WP BA
MARQUIS	63.9	4.00	3	102.8	90.99	905	2	1						WP M65
WALDRON	64.6	4.50	3	101.0	88.09	975	2	3						M65
HS 7664	60.4	6.50	0	101.8	89.99	845	8	1						WP BA DO
HS 79304	60.5	4.75	3	100.5	89.99	855	8	1						WP BA
HS 79348	60.5	5.00	3	101.0	89.09	870	8	1						TW WP BA
ID 0162	59.9	6.50	4	102.5	88.09	880	8	1						WP BA
MN 7357	62.0	4.75	3	101.0	89.09	875	5	2						WP BA
MN 73167	62.5	4.00	3	102.0	87.09	840	5	3						WP
MN 73168	62.4	4.75	3	100.0	88.99	875	5	3						WP
MT 7648	62.6	8.25	3	101.0	87.09	910	8	1						LG MT
MT 7836	64.4	6.00	3	103.8	88.99	920	4	3						
ND 573	66.4	4.00	3	102.8	85.09	900	2	4						
ND 574	67.3	4.50	3	100.0	88.05	910	2	3						
ND 575	67.2	5.00	4	101.7	88.09	870	4	3						
ND 581	69.3	5.50	3	100.5	87.09	900	2	4						
ND 585	69.1	4.25	3	102.5	87.09	865	2	4						
NK 755 2631	64.1	4.50	4	101.0	87.09	845	5	1						WP M65
NK 755 2634	63.7	5.00	4	102.8	89.99	850	5	1						WP
RL 4352	66.1	4.00	3	101.0	87.09	950	2	3						WP M65
SD 2854	65.4	3.50	3	101.5	88.09	980	2	4						
SD 2860	69.3	4.75	3	101.0	87.05	955	2	4						
SD 2861	67.1	4.00	3	101.5	86.07	870	2	3						
SD 2868	66.6	3.50	4	101.5	87.05	900	4	3						
WA 6865	69.1	5.75	3	100.0	86.09	915	3	3						
WA 6870	67.0	4.00	3	101.0	87.09	925	2	4						
X 6718	69.1	9.00	2	100.0	86.05	810	8	1						MT LV
X 6753	65.4	5.75	3	102.0	85.05	865	4	3						WP

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY.

7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK.

10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY.

XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN.

XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 3

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	LG	KERNEL MED	SIZE SM	WHT. MIN. 2/	WHT. PRO. 2/	KERN. CHAR. 3/	FLR. EXT. %	FLR. MIN.@ 65XEX. 2/	FLR. PRO. 4/	MLG. CHAR. 4/	MLG. PER. 3/	MIX. ABS. 2/	MIX. PAT. 5/
WESTERN AREA															
BUTTE	60.7	29.3	19	77	4	1.48	13.7	3	68.3	0.34	12.8	1	2	64.7	5
CHRIS	59.8	26.0	11	82	7	1.57	14.6	3	67.9	0.38	13.5	1	3	65.3	5
ERA	59.4	27.0	13	79	8	1.52	12.8	6	68.9	0.39	11.8	1	3	61.0	7
MARQUIS	58.9	26.4	13	80	7	1.62	14.3	3	65.3	0.39	13.1	1	5	64.4	6
WALDRON	58.8	30.2	24	73	3	1.65	14.7	2	66.7	0.39	13.8	1	4	66.3	6
HS 7664	59.8	29.6	21	73	6	1.59	13.1	5	68.9	0.36	12.2	1	2	60.0	10
HS 79304	58.3	27.1	17	76	7	1.64	14.1	3	68.4	0.38	13.1	1	3	62.5	6
HS 79348	56.2	27.2	18	75	7	1.59	13.7	5	68.0	0.35	12.6	1	2	62.5	7
ID 0162	59.3	29.1	13	79	8	1.57	12.8	6	67.9	0.34	11.8	1	2	64.2	8
MN 7357	58.3	28.8	18	75	7	1.52	13.3	5	67.9	0.36	12.0	1	2	65.0	9
MN 73167	60.1	29.0	17	76	7	1.55	13.4	5	68.9	0.38	12.3	1	2	64.7	8
MN 73168	58.7	28.7	15	79	6	1.55	13.4	6	68.4	0.35	12.2	1	3	66.3	8
MT 7648	59.0	26.0	10	79	11	1.63	14.5	4	67.0	0.36	13.6	1	2	66.3	8
MT 7836	59.5	30.9	23	72	5	1.58	14.3	2	68.4	0.33	13.4	1	2	68.0	3
ND 573	60.4	28.8	17	78	5	1.62	14.2	2	67.3	0.33	13.2	1	2	64.7	6
ND 574	59.0	30.6	22	74	4	1.58	14.5	2	67.7	0.38	13.8	1	3	65.7	5
ND 575	59.3	30.6	26	69	5	1.51	13.9	2	68.0	0.35	13.1	1	2	65.3	6
ND 581	59.5	30.6	24	69	7	1.58	14.5	2	67.1	0.45	13.9	1	2	66.3	6
ND 585	59.4	28.1	17	76	7	1.49	13.8	4	68.2	0.38	13.1	1	3	66.3	6
NK 755 2631	59.6	28.0	15	78	7	1.51	13.2	5	67.5	0.41	12.1	1	5	62.3	6
NK 755 2634	59.4	27.8	17	77	6	1.59	13.2	5	69.1	0.38	12.1	1	3	64.7	6
RL 4352	60.1	28.4	17	78	5	1.52	14.9	2	68.4	0.39	13.9	1	3	60.6	5
SD 2854	58.1	28.7	12	82	6	1.64	14.1	4	68.9	0.37	13.4	1	2	66.6	5
SD 2860	60.0	28.4	17	75	8	1.66	13.8	4	68.8	0.37	12.7	1	2	66.3	6
SD 2861	58.9	32.3	22	72	6	1.61	13.2	5	68.5	0.41	12.6	1	5	64.7	6
SD 2868	60.3	29.8	18	77	5	1.54	13.9	2	69.9	0.37	13.1	1	2	64.4	5
WA 6865	57.8	30.3	11	79	10	1.66	14.1	4	70.0	0.36	13.2	1	2	65.7	5
WA 6870	58.0	28.8	15	76	9	1.60	13.6	6	70.8	0.36	12.9	1	2	64.2	5
X 6718	59.5	32.1	20	75	5	1.50	14.1	2	70.8	0.37	13.2	1	2	67.9	8
X 6753	58.8	27.0	15	77	8	1.57	13.0	6	70.5	0.36	12.1	1	2	64.2	8

TABLE 3 (Cont.)

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

1981 CROP

VARIETY OR SEL. NO.	BAKE ABS. 2/	MIX TIME 6/	DOUGH CHAR. 7/	CRUMB GRAIN 8/	LOAF VOL. 3/	BAKE FVAL. 9/	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	2/	6/	7/	8/	3/	9/			
WESTERN AREA									
BUTTE	65.1	3.75	4	102.0	87.05	2	4		
CHRIS	65.6	3.75	4	103.0	89.09	2	4		
ERA	61.7	5.00	5	104.0	88.09	8	1		WP BA
MARQUIS	64.8	4.25	3	102.0	88.05	4	2		
WALDRON	66.7	4.25	3	102.0	89.09	4	2		
HS 7664	60.9	6.75	5	103.6	88.09	8	1		BA
HS 79304	63.4	5.00	3	102.5	87.09	6	2		EA
HS 79348	63.5	5.50	4	103.0	88.09	5	3		TW BA
ID 0162	65.3	5.75	3	104.6	87.05	4	3		WP
MN 7357	65.5	7.00	2	103.5	85.09	6	2		DO
MN 73167	65.9	6.00	3	101.5	89.99	5	3		
MN 73168	67.5	6.25	3	103.0	88.09	5	3		
MT 7648	67.4	6.00	3	103.0	87.09	8	3	MT DO	
MT 7836	66.9	5.75	3	103.8	89.99	4	3		
ND 573	65.8	4.25	3	102.0	87.07	4	3		
ND 574	66.6	4.00	4	102.0	88.09	2	4		
ND 575	66.4	4.75	3	103.0	87.05	4	3		
ND 581	67.8	5.00	3	100.5	87.09	4	1		M65
ND 585	67.7	4.75	3	101.0	87.09	4	3		
NK 755 2631	63.7	5.00	4	100.0	86.09	5	2		M65 BA
NK 755 2634	66.0	5.00	4	104.0	86.09	2	4		
RL 4352	67.8	4.00	3	101.5	87.09	4	3		
SD 2854	63.1	3.50	3	103.5	88.09	3	3		
SD 2860	68.3	4.50	3	100.0	86.05	3	3		
SD 2861	66.7	4.75	4	101.5	89.09	2	3		M65
SD 2868	66.2	3.50	4	103.5	86.05	2	4		
WA 6865	67.6	4.00	3	101.0	87.09	4	3		
WA 6870	66.2	4.50	3	102.0	88.09	4	3		
X 6718	69.4	7.25	3	104.0	85.05	5	3		
X 6753	66.0	6.00	3	103.0	87.05	6	2		WP

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY. XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN. XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 4

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	KERNEL SIZE			WHT. MIN. 2/ %	WHT. PRO. 2/ %	KERN. CHAR. 3/ %	FLR. EXT. %	MIN. @ 65% EX. 2/ %	FLR. PRO. 4/ %	MLG. CHAR. 3/ %	MLG. PER. 3/ %	MIX. ABS. 2/ %	MIX. PAT. 5/ %
			LG	MED	SM										
SOUTHEASTERN AREA AVERAGES															
BUTTE	62.0	33.9	44	54	2	1.71	14.3	2	71.4	0.37	13.4	1	1	62.8	4
CHRIS	60.4	29.2	18	79	3	1.76	15.0	3	69.9	0.39	14.3	1	2	61.6	3
ERA	60.1	29.9	26	70	4	1.67	12.6	8	71.7	0.40	11.6	1	2	58.1	4
WALDRON	59.4	33.6	44	53	3	1.86	15.1	3	69.4	0.44	13.9	1	5	63.2	6
AREA AVERAGE	59.6	32.2	33	63	4	1.75	13.7	5	70.0	0.41	12.8	1	3	63.4	6
NORTHEASTERN AREA AVERAGES															
BUTTE	61.3	30.3	29	69	2	1.63	15.4	2	71.1	0.35	14.6	1	2	65.0	5
CHRIS	59.1	25.5	10	85	5	1.64	16.0	4	70.4	0.37	15.6	1	2	64.2	5
ERA	59.0	26.6	14	80	6	1.70	14.1	6	71.9	0.41	13.4	1	4	61.5	6
WALDRON	57.5	30.1	27	70	3	1.78	16.1	3	69.7	0.42	15.3	1	5	65.0	6
AREA AVERAGE	58.0	28.6	20	75	5	1.72	15.0	5	70.0	0.40	14.3	1	3	64.1	7
WESTERN AREA AVERAGES															
BUTTE	60.7	29.3	19	77	4	1.48	13.7	3	68.3	0.34	12.9	1	2	64.7	5
CHRIS	59.8	26.0	11	82	7	1.57	14.6	3	67.9	0.38	13.5	1	3	65.3	5
ERA	59.4	27.0	13	79	8	1.52	12.8	6	68.9	0.39	11.8	1	3	61.0	7
WALDRON	58.8	30.2	24	73	3	1.65	14.7	2	66.7	0.39	13.8	1	4	66.3	6
AREA AVERAGE	59.2	28.9	17	76	7	1.58	13.8	4	68.4	0.37	12.9	1	2	64.8	7
CROP YEAR AVERAGES															
1978 AVERAGE	59.8	34.9	36	60	4	1.75	14.3	8	70.7	0.40	13.6	1	1	63.0	4
1979 AVERAGE	59.8	31.7	34	63	3	1.66	13.7	8	69.7	0.39	12.7	1	1	63.8	5
1980 AVERAGE	59.4	31.1	32	64	4	1.71	14.4	8	70.0	0.39	13.7	1	1	65.7	6
1981 AVERAGE	58.9	29.9	23	72	5	1.66	14.2	8	69.5	0.39	13.3	1	1	64.1	7
78 - 81 AVG	59.5	31.9	31	65	4	1.70	14.2	8	70.0	0.39	13.3	1	1	64.2	5

TABLE 4 (Cont.)

QUALITY DATA OF UNIFORM REGIONAL NURSERY BLENDS

1981 CROP

VARIETY OR SEL. NO.	BAKE ABS.	MIX. TIME	DCUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	2/ 3/	4/ 5/	6/ 7/	8/ 9/	10/ 11/	12/ 13/	14/ 15/	16/ 17/	18/ 19/	20/ 21/
SOUTHEASTERN AREA AVERAGES										
BUTTE	64.7	3.00	3	100.0	87.99	925	2	4		
CHRIS	63.1	4.00	3	102.0	89.10	985	4	3		
ERA	60.1	4.00	4	103.8	91.99	900	8	1		WP BA
WALDRON	64.6	4.50	3	101.0	88.09	975	2	3		M65
AREA AVERAGE	64.8	5.00	3	101.0	88.06	896	3	3		
NORTHEASTERN AREA AVERAGES										
BUTTE	65.7	4.00	3	100.0	88.09	980	2	4		
CHRIS	64.8	4.00	3	102.0	87.07	980	2	4		
ERA	64.9	5.00	3	102.0	87.09	970	2	3		
WALDRON	66.6	4.25	3	100.0	88.09	1000	2	3		WP M65
AREA AVERAGE	65.6	5.25	3	101.0	87.05	971	2	4		
WESTERN AREA AVERAGES										
BUTTE	65.1	3.75	4	102.0	87.05	825	2	4		
CHRIS	65.6	3.75	4	103.0	89.09	875	2	4		
ERA	61.7	5.00	5	104.0	88.09	825	8	1		
WALDRON	66.7	4.25	3	102.0	89.09	885	4	2		WP BA
AREA AVERAGE	66.0	5.00	3	102.7	87.06	855	4	3		
CROP YEAR AVERAGES										
1978 AVERAGE	63.7	3.25	4	101.0	87.05	935	8	1		SM WM MT DO
1979 AVERAGE	64.1	4.00	3	101.0	88.06	944	8	1	SM	WM MT DO
1980 AVERAGE	66.6	4.50	3	101.0	88.06	948	8	1		SM WM MT DO
1981 AVERAGE	65.0	5.00	3	101.7	87.05	907	8	1		SM WM MT DO
78 - 81 AVG	64.8	4.25	3	101.7	88.05	934	8	1		SM WM MT DO

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY.

7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK.

10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY.

XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN.

XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 5

QUALITY DATA OF UNBLENDED UNIFORM NURSERY SAMPLES

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	KERNEL SIZE			WHT. MIN. 2/	WHT. PRO. 2/	KERN. CHAR. 3/	FLR. EXT. 2/	FLR. MIN. @ 65% EX. 2/	FLR. PRO. 4/	MLG. CHAR. 3/	MLG. PER. 3/	MIX. ABS. 2/	MIX. PAT. 5/
			LG	MED	SM										
SHERIDAN, WYOMING															
1981 STD	59.3	31.7	45	54	1	1.70	15.6	2	61.2	0.49	14.6	1	2	66.0	8
FIELDWIN	56.5	24.2	4	81	15	1.41	13.3	8	39.0	0.34	12.1	4	8	58.7	3
PROBRAND 711	58.5	32.5	10	82	8	1.36	14.3	8	59.5	0.39	13.5	1	2	62.5	11
PRODAX	56.5	32.2	8	86	6	1.46	14.5	8	53.5	0.45	13.6	1	8	61.3	9
PULLMAN, WASHINGTON															
1981 STD	59.3	31.7	45	54	1	1.70	15.6	2	61.2	0.49	14.6	1	2	66.0	8
MC KAY	60.5	35.0	40	55	5	1.78	13.3	8	51.6	0.50	12.6	1	8	64.2	6
WAMPUM	60.5	31.9	33	63	4	1.52	11.9	8	52.7	0.49	11.2	1	8	60.3	7
WA 6823	60.0	30.1	10	83	7	1.58	13.4	8	52.2	0.47	12.4	1	8	62.5	6
BROOKINGS, SOUTH DAKOTA															
1981 STD	59.3	31.7	45	54	1	1.70	15.6	2	61.2	0.49	14.6	1	2	66.0	8
WALERA	57.0	27.5	11	83	6	1.85	14.7	8	53.4	0.56	13.8	1	8	62.5	8
PRO 715	58.0	29.2	17	81	2	1.78	15.1	4	51.9	0.60	14.1	1	8	63.5	6
CARRINGTON, NORTH DAKOTA (IRRIG)															
1981 STD	59.3	31.7	45	54	1	1.70	15.6	2	61.2	0.49	14.6	1	2	66.0	8
HS 7348	54.0	27.5	20	73	7	1.65	15.1	8	55.1	0.49	14.4	1	8	63.8	6

VARIETY OR SEL. NO.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY			MAJOR DEFICIENCY												
									6/	7/	8/	2/	3/	9/	LG	SM	WP	EX	BA	DO	LV			
MIN.													CC.											
SHERIDAN, WYOMING																								
1981 STD	66.0	5.25	3	100.0	88.07	197	2	4																
FIELDRIN	58.7	2.75	6	105.6	88.09	165	8	1																
PROBRAND	711	6.50	4	104.2	85.09	181	8	1																
PRODAX	61.3	5.75	6	102.0	87.09	178	8	1																
PULLMAN, WASHINGTON																								
1981 STD	66.0	5.25	3	100.0	88.07	197	2	4																
MC KAY	64.2	3.50	6	104.9	91.99	177	8	1																
WAMPUM	60.3	5.50	5	104.2	89.99	182	8	1																
WA 6823	0.0	0.0	0	0.0	0.0	0	8	1																
BROOKINGS, SOUTH DAKOTA																								
1981 STD	66.0	5.25	3	100.0	88.07	197	2	4																
WALERA	62.5	5.25	5	103.0	85.05	203	8	1																
PRO 715	63.5	5.50	5	101.0	88.09	192	8	1																
CARRINGTON, NORTH DAKOTA (IRRIG)																								
1981 STD	66.0	5.25	3	100.0	88.07	197	2	4																
HS 7348	63.8	3.75	4	102.0	86.07	209	7	1																

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY.

7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK.

10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY.

XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN.

XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 6

QUALITY DATA OF UNBLENDED UNIFORM NURSERY SAMPLES

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	G.	KERNEL		SIZE SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN. @ 65% EX.	FLR. PRO.	MLG. CHAR.	MLG. PER.	MIX. ABS.	MIX. PAT.
				LG	MED											
WILLISTON, NORTH DAKOTA																
BUTTE	53.5	18.9		1	77	22	1.95	18.3	3	58.1	0.48	17.6	1	1	67.9	8
CHRIS	56.5	20.1		0	91	9	1.98	18.3	8	56.9	0.50	18.1	1	2	65.3	6
ERA	54.0	20.2		2	83	15	1.95	17.5	4	61.2	0.49	16.6	1	2	64.2	10
MARQUIS	58.0	24.0		2	89	9	1.95	17.6	3	55.1	0.50	17.3	1	3	68.5	17
WALDRON	53.0	21.8		3	87	10	2.09	18.7	3	56.0	0.54	18.2	1	4	68.5	10
HS 7664	54.0	22.1		2	84	14	2.04	17.2	5	54.6	0.49	16.7	1	4	63.5	11
HS 79304	55.0	21.7		1	89	10	1.93	18.2	3	58.3	0.50	17.5	1	2	64.7	8
ID 0162	56.0	22.0		2	78	20	1.87	16.5	5	52.1	0.47	16.1	1	8	61.9	11
MT 7836	54.0	22.0		0	84	16	1.92	17.9	8	53.9	0.50	17.6	1	4	70.9	11
ND 573	57.5	20.7		1	83	16	1.91	17.5	4	53.5	0.48	17.3	1	4	69.7	9
ND 585	54.0	20.8		1	85	14	1.85	18.2	2	54.5	0.53	17.3	1	5	68.5	9
NK755 2631	55.5	22.6		4	85	11	1.93	17.5	4	53.9	0.62	16.8	1	2	65.7	5
RL 4352	58.5	24.4		4	91	5	1.85	18.6	1	56.5	0.54	18.4	1	3	67.9	5
SD 2854	51.5	21.6		1	83	16	1.88	18.4	4	55.1	0.43	18.2	1	2	68.5	7
SD 2860	54.5	20.9		1	86	13	1.98	18.4	3	55.8	0.52	17.9	1	3	69.1	8
WA 6865	53.0	19.8		0	70	30	1.97	19.1	8	56.5	0.48	18.9	1	2	70.5	9
X 6718	55.0	23.4		2	84	14	1.62	17.7	3	55.7	0.49	17.1	1	2	67.9	11
X 6753	53.0	19.5		1	83	16	1.85	18.0	3	56.7	0.49	17.8	1	2	67.6	11

TABLE 6 (Cont.)

QUALITY DATA OF UNBLENDED UNIFORM NURSERY SAMPLES

1981 CROP

VARIETY OR SEL. NO.	BAKE ABS. 2/	MIX. TIME 6/	DOUGH CHAR. 7/	CRUMB COLOR 8/	CRUMB GRAIN 9/	LOAF VOL. 3/	BAKE EVAL. 9/	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
WILLISTON, NORTH DAKOTA										
BUTTE	67.9	5.25	3	100.5	88.10	191	2	4		
CHRIS	65.3	4.00	3	102.5	87.09	200	4	1		LG
ERA	64.2	7.00	2	101.5	85.07	213	8	1	BA DO	BA
MARQUIS	68.5	4.50	3	100.5	83.07	200	2	4		
WALDRON	68.5	6.50	3	100.5	80.05	210	2	3	M65	
HS 7664	63.5	8.75	3	100.5	85.07	201	8	1	WP EX MT	BA
HS 79304	64.7	5.75	3	101.5	86.09	215	5	3		BA
ID 0162	61.9	7.25	3	102.5	83.05	212	8	1		WP
MT 7836	70.9	10.00	2	102.8	80.05	219	5	1	EX MT DO	EX BA
ND 573	69.7	7.50	3	103.0	78.07	216	2	3	WP	LG
ND 585	68.5	6.75	3	100.5	86.10	198	2	3	EX M65	EX
NK75S 2631	65.7	4.75	3	100.0	87.10	214	3	1	WP EX BA	M65
RL 4352	67.9	3.75	4	101.5	83.05	192	5	2	M65 DO	
SD 2854	68.5	5.75	3	102.0	83.07	214	2	4	TW	
SD 2860	69.1	6.00	4	100.0	86.07	205	4	3	DO	
WA 6865	70.5	6.00	3	103.0	85.07	219	2	1	SM	LG
X 6718	67.9	13.50	3	102.0	83.07	208	8	1		MT
X 6753	67.6	12.00	3	103.0	84.07	198	8	1		MT

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY. XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN. XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 7
QUALITY DATA OF FIELD PLOT SAMPLES

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	KERNEL SIZE		WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN. @ 65% EX.	FLR. PRO.	MLG. PER.	MIX. ABS.	MIX. PAT.	
		G.	LG	SM	27 %	27 %	37 %	37 %	27 %	37 %	47 %	27 %	57 %	
IMPERIAL VALLEY, CALIFORNIA														
OSLO	63.1	39.7	49	51	0	1.33	13.2	2	74.0	0.32	11.7	1	62.5	4
1981 STD.	59.3	31.7	45	54	1	1.70	15.6	8	72.0	0.41	15.3	1	66.7	5
ANZA	63.5	37.0	55	43	2	1.44	12.4	5	72.6	0.31	10.9	1	59.7	1
CAJEME	61.6	45.5	63	35	2	1.45	14.3	3	71.3	0.35	12.7	1	61.3	5
PROBRAND	59.6	41.5	48	50	2	1.38	14.2	3	71.8	0.32	12.5	1	61.3	6
PROBRD	62.1	46.7	67	32	1	1.40	13.5	2	71.6	0.34	12.5	1	62.8	6
YECORO ROJO	62.8	46.1	66	33	1	1.42	14.3	2	71.5	0.32	13.1	1	62.5	6
SGWOD 100	62.8	40.2	67	32	1	1.48	13.5	2	71.6	0.36	12.1	1	62.5	4
SGY 022	62.4	49.8	61	37	2	1.38	13.8	3	72.3	0.34	12.5	1	61.6	5
UC 353	62.5	36.6	37	61	2	1.46	12.2	7	73.4	0.32	11.2	1	62.5	2
UC 353	62.8	36.6	41	58	1	1.43	12.2	6	73.5	0.32	10.9	1	61.3	2
UC 355	64.6	37.9	47	52	1	1.46	13.2	3	70.0	0.29	11.7	1	64.2	3
UC 357	62.8	40.8	64	35	1	1.43	14.3	2	72.1	0.33	12.7	1	66.3	4
UC 360	62.8	35.3	48	51	1	1.43	14.3	3	72.1	0.33	12.5	1	61.9	2
UC 431	63.4	43.3	60	39	1	1.43	11.9	6	71.2	0.37	11.2	1	66.0	5
UC 485	63.9	38.9	53	46	1	1.47	12.9	2	70.4	0.36	11.3	1	64.2	3
UC 486	63.2	38.0	43	56	1	1.38	12.6	4	72.2	0.33	12.1	1	65.3	4
UC 487	62.9	33.0	14	84	2	1.51	13.8	5	73.1	0.33	12.0	1	63.5	3
UC 488	63.5	36.9	32	60	1	1.47	13.0	3	72.9	0.37	11.5	1	64.7	3
UC 490	59.9	33.3	22	70	2	1.52	12.7	7	68.0	0.41	11.9	1	60.3	3
UC 491	62.9	39.1	58	41	1	1.39	13.3	2	71.3	0.37	11.9	1	62.8	3
UC 492	59.1	39.2	57	41	2	1.46	10.8	8	67.1	0.36	10.5	1	59.3	2
UC 493	60.2	37.9	56	42	2	1.50	12.4	6	68.3	0.43	10.6	1	62.3	2
UC 494	61.5	36.0	61	38	1	1.46	11.9	7	67.6	0.39	10.1	1	62.8	3
225-R	62.5	44.8	70	29	1	1.46	14.0	3	68.4	0.37	12.0	1	65.0	6
1817	63.3	44.8	75	24	1	1.35	13.5	2	73.8	0.30	12.4	1	61.6	8
UC 293 A	64.0	36.8	47	52	1	1.42	13.2	3	73.1	0.32	11.9	1	62.3	4
UC 293 B	61.6	35.3	53	45	2	1.46	13.5	4	68.6	0.36	11.9	1	66.6	5

TABLE 7 (Cont.)
QUALITY DATA OF FIELD PLOT SAMPLES

VARIETY OR SEL. NO.	BAKE ABS.	PIX. TIME	DCUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VUL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
	2/	MIN.	5/	7/	8/	CC.	3/	9/		
IMPERIAL VALLEY, CALIFORNIA										
OSLO	63.2	4.25	4	103.8	87.09	830	2	4		
1981 STD.	66.7	3.75	4	100.0	89.59	879	1	1		
ANZA	60.1	1.75	7	102.0	86.99	680	8	1		
CAJEME	61.7	3.25	4	102.5	89.70	825	4	2		
PROBRAND	62.0	4.75	5	102.0	87.09	855	6	2		
PROBRED	63.5	4.00	4	102.0	85.09	850	2	3		
YECORO ROJO	63.2	4.50	4	103.9	84.05	830	2	4		
SGWOD 100	63.2	3.00	5	103.8	86.09	800	4	1		
SGY 022	62.5	4.50	5	101.0	85.07	795	5	2		
UC 353	63.2	2.00	6	101.5	89.99	820	6	2		
UC 353	61.8	2.25	7	102.5	88.09	810	8	1		
UC 355	64.5	1.50	5	101.0	89.09	830	5	2		
UC 357	67.3	2.25	4	100.0	89.99	795	2	3		
UC 360	62.8	1.75	8	102.0	87.99	770	8	1		
UC 431	66.5	3.25	5	102.0	87.09	850	4	1		
UC 485	64.8	2.25	6	103.8	87.09	750	5	1		
UC 486	66.0	2.25	6	102.0	87.09	785	5	2		
UC 487	64.0	2.25	3	103.6	86.07	800	4	3		
UC 488	65.4	2.25	6	103.6	87.09	810	4	1		
UC 490	61.7	2.50	7	103.0	89.99	850	8	1		
UC 491	63.9	2.50	6	102.5	85.05	785	5	1		
UC 492	60.7	2.75	4	103.6	87.10	735	8	1		
UC 493	63.2	2.00	8	102.0	89.99	710	8	1		
UC 494	63.7	2.50	8	103.0	88.10	710	8	1		
225-R	66.0	3.50	4	103.9	84.07	755	2	1		
1817	62.6	4.75	3	104.9	85.07	790	5	3		
UC 293 A	63.0	3.00	3	104.9	85.07	815	4	3		
UC 293 B	67.5	3.00	4	104.9	87.09	820	2	1		

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY

7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK.

10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY.

XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN.

XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 8

QUALITY DATA OF FIELD PLOT SAMPLES

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	KERN. LG	KERN. MED	KERN. SIZE SM	WHT. MIN. 2/	WHT. PRO. 2/	KERN. CHAR. 3/	FLR. EXT. %	FLR. MIN. @ 65% EX. 2/	FLR. PRO. %	MLG. CHAR. 4/	MLG. PER. 3/	MIX. ABS. 2/	MIX. PAT. 5/
MESA, ARIZONA															
OSLO	63.1	36.8	46	52	2	1.26	13.2	2	73.5	0.38	13.0	1	2	62.3	4
1981 STD.	59.3	31.7	45	54	1	1.70	15.6	8	72.0	0.41	15.3	1	5	66.7	5
VEERY #1	63.4	42.9	80	19	1	1.36	11.9	5	71.0	0.44	11.7	1	8	61.9	4
VEERY #2	63.3	41.0	71	28	1	1.27	11.9	5	70.0	0.39	11.5	1	4	61.3	3
VEERY #3	63.0	39.7	67	31	2	1.32	12.4	4	71.5	0.39	11.9	1	3	61.0	4
C79-97	62.5	39.5	57	41	2	1.35	11.9	6	71.6	0.40	10.7	1	5	64.2	7
C79-281	62.0	38.6	54	44	2	1.29	12.8	3	69.4	0.36	11.8	1	4	65.7	4
UC 355	62.6	39.5	66	33	1	1.45	12.2	5	69.2	0.35	11.8	1	4	64.2	2
ABU GRAIB #3	63.2	35.6	45	53	2	1.30	12.4	4	64.8	0.41	11.0	1	8	64.7	4
BOB WHITE	63.5	42.7	75	24	1	1.33	11.9	5	70.0	0.37	10.0	1	6	62.5	4
NACAZARI 76	62.4	40.0	66	32	2	1.34	11.4	8	69.2	0.38	10.6	1	5	64.7	4
PAVON 76	63.9	44.2	71	26	3	1.34	12.0	5	68.6	0.38	10.5	1	2	64.2	4
SONALIKA	63.2	57.8	91	8	1	1.31	12.2	4	71.7	0.36	11.2	1	2	62.8	2
YECORATA 77	63.0	48.8	74	25	1	1.34	12.4	4	70.6	0.38	11.7	1	4	64.2	7
MAYA-77-30	61.7	40.3	60	38	2	1.33	11.8	6	70.9	0.79	11.3	1	8	64.2	3
NK 775 1817	64.3	49.0	84	15	1	1.30	12.0	4	72.9	0.42	11.8	1	5	63.8	8
SGV 012	63.1	50.3	72	27	1	1.32	13.2	2	71.0	0.43	12.5	1	8	65.0	6
CAJEME 71	63.5	49.8	78	21	1	1.30	13.7	2	72.9	0.46	12.9	1	8	65.7	5
225-R	62.6	44.2	61	38	1	1.45	13.2	3	68.9	0.46	12.1	1	8	65.3	5
YECORA ROJO	64.0	47.4	78	21	1	1.42	13.6	2	72.8	0.46	12.6	1	8	65.7	5
SGO-698	65.7	40.0	68	31	1	1.35	13.7	2	72.6	0.44	13.1	1	8	65.7	4

TABLE 8 (Cont.)

QUALITY DATA OF FIELD PLOT SAMPLES

1981 CROP

VARIETY OR SEL. NO.	BAKE ABS. 2/	MIX TIME MIN.	DOUGH CHAR. 6/	CRUMB COLOR 7/	CRUMB GRAIN 8/	LOAF BAKE VOL. EVAL. 3/	GEN. EVAL. 9/	MINOR DEFICIENCY	MAJOR DEFICIENCY
MESA, ARIZONA									
OSLO	62.8	3.25	3	102.5	89.99	835	4		
1981 STD.	66.7	3.25	4	100.0	89.99	879	4		
VEERY #1	62.5	3.25	2	103.6	85.05	745	5	M65 DO	TW WM
VEERY #2	61.9	3.00	7	103.6	86.07	710	8	LV	WP M6S
VEERY #3	61.9	3.00	6	102.0	87.10	780	8		WP DO
C79-97	65.1	5.00	7	103.9	86.05	710	8	MT LV	WP DO
C79-281	66.1	3.00	7	103.9	87.00	765	8		DO DO
UC 355	64.7	1.75	8	102.0	89.99	750	8		WM EX DO
ABU GRAIB #3	65.6	3.75	30	103.0	86.07	695	8	M6S	EX PD DO
BOB WHITE	63.5	3.00	30	103.0	85.99	595	8		WP PD DO
NACQZARI 76	65.6	2.50	7	102.8	88.99	730	8	LV	WP EX DO
PAVON 76	64.9	3.50	7	102.8	86.07	755	8	WP LV	EX PD DO
SONALIKA	63.4	1.50	7	104.9	88.99	735	8	MT LV	DO DO
YECORATA 77	65.2	4.75	5	103.9	87.10	765	8	WP EX LV	DO DO
MAYA-77-30	64.9	3.00	7	101.0	86.05	750	8	LV	WP M6S DO
NK 77S 1817	64.7	5.50	4	104.9	80.09	800	6	MT DO	M6S DO
SGY 012	65.3	5.00	5	102.0	86.09	805	8		M6S DO
CAJEME 71	66.0	3.50	5	101.8	90.99	825	8		M6S DO
225-R	65.6	4.00	9	101.8	89.99	780	8	PD	WM EX
YECORA ROJO	66.0	3.50	6	100.0	89.70	825	8	WM PD	M6S DO
SGO-69B	66.0	2.50	9	101.0	89.99	800	8	WM	M6S DO

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY

7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK.

10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY.

XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN.

XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 9

QUALITY DATA OF FIELD PLOT SAMPLES

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	G.	KERN. LG.	SIZE MED.	SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN. @ 65% EX.	FLR. PRO.	MLG. CHAR.	MLG. PER.	MIX. ABS.	MIX. PAT.
			%	%	%	%	2/ %	2/ %	3/ %	2/ %	2/ %	2/ %	4/ %	3/ %	2/ %	5/ %
WILLISTON, NORTH DAKOTA																
AIM	53.9	18.5	1	79	20		1.64	15.9	5	69.4	0.39	14.4	1	2	64.2	9
ALEX	55.8	21.5	1	88	11		1.91	17.9	4	67.2	0.41	16.2	1	3	66.6	9
BENITO	52.3	20.2	1	85	14		1.87	17.3	5	67.4	0.40	16.1	1	3	62.5	5
BUTTE	56.9	24.3	1	93	6		1.69	15.5	5	69.0	0.39	14.1	1	2	64.2	6
COTEAU	54.2	21.8	1	91	8		1.87	17.5	5	69.1	0.45	16.4	1	8	67.0	6
ELLAR	53.9	22.9	2	92	6		1.88	16.4	4	67.9	0.42	15.2	1	3	63.5	9
ERA	55.4	22.3	1	91	8		1.63	15.6	5	70.3	0.36	14.2	1	1	61.9	8
JAMES	53.6	23.6	2	87	11		1.77	16.5	4	70.5	0.36	15.4	1	1	64.7	7
LEN	55.3	23.8	5	88	7		1.66	16.6	2	70.4	0.38	15.1	1	1	66.6	9
LEN (LATE)	59.7	26.7	12	83	5		1.52	15.9	2	70.4	0.36	14.6	1	1	69.7	9
LEW	57.9	23.8	3	87	10		1.77	16.9	3	69.8	0.42	15.6	1	3	68.5	10
MARBERG	54.5	22.4	1	80	19		1.71	16.5	5	68.0	0.38	15.4	1	2	64.7	11
OLAF	55.0	24.2	3	89	8		1.71	16.5	3	67.8	0.39	14.7	1	2	63.2	9
OSLO	55.5	24.8	2	86	12		1.46	14.7	6	68.9	0.31	14.2	1	1	62.8	7
PONDERA	58.0	22.5	1	80	19		1.68	16.6	4	69.5	0.35	15.3	1	1	64.7	8
PROBRAND 711	56.8	23.9	2	80	18		1.72	15.8	5	70.5	0.36	14.8	1	1	64.2	11
PROBRAND 715	56.2	23.4	3	89	12		1.66	16.0	3	68.7	0.44	14.4	1	5	62.5	6
PRODAX	53.6	23.1	1	87	12		1.74	16.9	5	66.8	0.42	15.9	1	4	64.7	8
SOLAR	55.1	21.6	2	85	13		1.72	15.7	5	69.9	0.35	14.1	1	1	62.5	9
TRACEY	55.5	22.3	2	87	11		1.58	16.6	3	68.8	0.38	15.1	1	2	68.2	6
WALDRON	54.7	26.5	6	89	5		1.75	17.2	2	68.1	0.41	15.9	1	3	66.3	7
WALERA	55.7	23.1	2	88	10		1.72	15.4	5	70.7	0.35	13.7	1	1	62.5	8
WARED	56.0	20.8	2	84	14		1.61	15.7	5	69.2	0.36	14.2	1	2	63.2	8
WESTHRD 206R	56.4	28.4	11	83	6		1.69	16.1	2	68.4	0.35	14.7	1	2	64.2	10
MN 70170R	55.6	22.2	2	87	11		1.63	15.5	5	71.3	0.35	14.3	1	1	62.5	6
MP108	60.1	27.5	13	80	7		1.45	15.4	4	70.7	0.38	14.3	1	1	69.7	5
ND 573	54.3	22.4	3	86	11		1.76	16.8	4	66.3	0.40	15.6	1	3	69.1	9
ND 574	53.5	22.1	2	92	16		1.77	17.2	4	66.3	0.39	15.6	1	3	67.9	7
ND 575	58.6	23.8	2	88	10		1.77	16.4	3	69.1	0.35	15.5	1	2	67.9	7
ND 580	55.7	25.1	12	83	5		1.80	16.8	2	68.7	0.38	15.4	1	2	64.2	6
ND 581	55.1	23.0	3	85	12		1.76	16.9	3	67.4	0.42	16.0	1	4	69.1	10
ND 582	55.1	21.5	1	83	16		1.88	17.2	5	67.7	0.40	16.1	1	3	67.0	8
ND 583	55.9	21.8	1	80	19		1.77	16.3	4	67.8	0.39	15.1	1	2	67.9	7
ND 584	57.0	35.7	29	68	3		1.66	16.1	2	69.3	0.38	14.7	1	2	64.4	8
ND 585	56.2	24.6	6	89	5		1.56	16.3	2	68.2	0.36	15.1	1	2	68.5	7
ND 586	54.4	20.4	2	91	7		1.74	17.2	4	69.1	0.37	16.0	1	2	69.1	7
PR 2360	52.9	20.2	0	82	18		1.70	16.8	8	69.9	0.37	15.5	1	1	68.5	11
X 6718	54.8	24.2	2	85	13		1.66	17.2	4	70.6	0.38	16.2	1	1	68.8	11

VARIETY OR SEL. NO.	BAKE ABS. %	MIX. TIME MIN.	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY		MAJOR DEFICIENCY
									3/	9/	
WILLISTON, NORTH DAKOTA											
AIM	64.8	6.25	3	102.5	87.09	870	2	4	TW SM		KW LG
ALEX	67.7	6.75	3	101.5	88.09	980	2	4	TW WM		LG
BENITO	63.1	3.25	3	103.6	89.99	840	5	2	TW KW	WM	LG BA
BUTTE	64.8	5.00	3	102.5	89.99	810	3	3	WP LV		LG
COTEAU	67.6	3.75	3	101.5	87.09	905	2	1	KW WM		LG M65
ELLAR	64.6	6.75	3	102.7	88.09	950	2	4	TW KW	WM M65	
ERA	62.8	5.25	3	103.6	89.99	900	5	3	TW LG		LG BA
JAMES	65.3	5.75	3	102.5	87.05	870	2	4			
LEN	67.6	6.50	3	101.5	87.05	945	2	4			
LEN (LATE)	70.6	7.50	3	102.5	86.05	960	2	4			
LEW	69.2	8.25	2	101.5	86.05	1025	4	3	M65 DO		LG DO
NARBURG	65.7	8.25	1	102.0	86.05	965	8	1	KW SM		
OLAF	63.9	6.75	2	101.0	87.10	940	6	2	BA DO		WP
OSLO	63.5	5.75	2	103.4	88.10	925	6	3	LG SM	BA DO	LG
PONDERA	65.3	6.00	2	104.0	87.05	970	4	3	KW SM	DO	
PROBRAND 711	64.6	7.75	1	103.0	86.09	900	8	1	LG SM		DO
PROBRAND 715	63.0	5.25	2	102.8	87.09	920	7	1	DO		M65 BA
PRODAX	65.3	5.50	3	102.5	87.09	895	2	3	TW KW	SM M65	LG
SOLAR	62.9	6.50	1	102.0	86.07	975	8	1	KW LG		BA DO
TRACEY	68.9	3.50	3	101.0	90.99	905	1	4	KW LG		
WALDRON	66.7	5.50	3	101.0	88.09	940	2	4			BA
WALERA	63.0	5.00	3	102.7	89.99	925	5	3	KW LG	WP SM	
WARED	63.8	5.50	3	102.7	89.99	890	4	4	KW LG	SM BA	
WESTBRO 906R	64.9	6.25	3	101.0	89.99	930	2	4			
MN 70170R	63.1	4.50	3	102.7	88.09	860	5	3	KW LG	WP	BA
MPI108	70.7	7.50	3	101.5	88.09	975	2	4	WP		
ND 573	70.2	7.00	2	102.5	87.09	940	4	3	KW DO		
ND 574	68.8	5.00	3	101.0	88.09	850	2	4	TW KW	LG	
ND 575	68.8	5.25	2	101.0	87.99	890	4	4	LG DO		
ND 580	64.8	5.00	3	101.0	88.99	835	3	4			
ND 581	70.1	8.50	1	103.5	86.05	960	8	1	KW SM	M65	DO
ND 582	67.5	5.75	3	102.0	87.09	920	2	4	KW SM	WM	LG
ND 583	69.1	4.75	3	101.0	88.99	855	2	4	KW SM		
ND 584	65.1	6.25	3	103.9	87.09	835	3	4	KW		
ND 585	69.2	5.25	3	103.5	85.05	850	2	4			
ND 586	69.7	5.75	3	102.5	85.05	855	2	4	KW LG		LG DO
PR 2360	69.4	9.75	1	102.5	84.07	895	8	1	TW KW	SM MT	DO
X 6718	69.7	13.00	1	101.0	85.05	975	8	1	LG SM		MT DO

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY.

7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY. XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN. XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

XXX.90 = SLIGHTLY IRREGULAR. XXX.99 = NORMAL.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

TABLE 10

QUALITY DATA OF INTERNATIONAL NURSERY SAMPLES

VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	KERNEL SIZE			WHT. MIN. 2/	WHT. PRO. 2/	KERN. CHAR. 3/	FLR. EXT.		MIN. @ 65% EX. 2/	FLR. PRO. 4/	MLG. CHAR. 3/	MLG. PER. 3/	NIX. ADS. 2/	NIX. PAT. 5/
			LG	MED	SM				EXT.	EXT.						
ST. PAUL, MINNESOTA																
BANKS	59.0	28.1	11	79	10	1.75	13.7	4	56.3	0.53	13.1	1	8	64.4	5	
BOBWHITE "S"	60.5	35.3	33	61	6	1.71	13.7	2	56.0	0.46	12.7	1	2	61.3	8	
ERA	61.5	31.3	24	70	6	1.72	13.5		63.7	0.44	12.8	1	2	62.3	5	
VEERY #1	60.0	35.0	34	62	4	1.74	13.9	2	53.7	0.51	13.4	1	8	65.0	6	
VEERY #2	59.0	34.5	24	70	6	1.66	13.9	3	54.2	0.50	13.4	3	8	70.9	6	
VEERY #3	58.0	32.7	16	75	9	1.69	14.2	4	54.0	0.48	13.9	1	8	62.5	5	
VEERY #4	60.0	31.8	9	83	8	1.63	14.2		54.4	0.50	13.5	1	8	59.7	5	
CGT 700	58.0	29.3	8	83	9	1.83	15.1	5	60.0	0.51	14.1	1	8	65.3	7	
SA 75	60.5	32.5	30	66	4	1.76	15.3	2	58.4	0.49	14.0	1	8	64.2	5	

TABLE 10 (Cont.)

QUALITY DATA OF INTERNATIONAL NURSERY SAMPLES

1981 CROP

VARIETY OR SEL. NO.	BAKE ABS. 3/	MIX. TIME	DOUGH CHAR. 6/	CRUMB COLOR 7/	CRUMB GRAIN 8/	LOAF VOL. 9/	BAKE EVAL. 3/	GEN. EVAL. 9/	MINOR DEFICIENCY			MAJOR DEFICIENCY		
									3/	9/	CC.	3/	9/	CC.
ST. PAUL, MINNESOTA														
BANKS	64.4	3.25	5	102.5	91.99	208	1	1						EX M65
BUJWHITE "S"	61.3	5.00	6	101.0	88.99	182	6	1		TW	KW	LG		EX
ERA	62.3	4.00	5	101.0	88.09	192	2	4		M65	BA	DO		EX
VEERY #1	65.0	4.50	3	102.5	88.10	202	4	1		DO				EX M65
VEERY #2	70.9	5.25	3	101.7	87.07	193	4	1		TW	DO			EX M65
VEERY #3	62.5	4.00	5	101.0	89.99	184	2	1						EX
VEERY #4	59.7	4.00	4	101.5	89.99	183	8	1		DO	LG	M65		LG EX M65 BA
CGT 700	65.3	4.00	3	101.0	87.09	195	4	1		TW	WM	DO		EX M65
SA 75	64.2	3.50	3	103.8	87.09	197	4	1		DO				EX M65

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GRITTY. 6 = VERY SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK---11 = VERY STRONG).

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX.9 = BRIGHT WHITE. XXX.8 = WHITE. XXX.7 = SLIGHTLY CREAMY. XXX.6 = BRIGHT CREAMY. XXX.5 = CREAMY. XXX.4 = VERY CREAMY. XXX.3 = GRAY.

XXX.2 = DULL GRAY. XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY. XXX.01 = THICK WALL OR HARSH. XXX.03 = CLOSE. XXX.05 = OPEN, IRREGULAR. XXX.06 = OPEN, SLIGHTLY IRREGULAR. XXX.07 = IRREGULAR, OPEN.

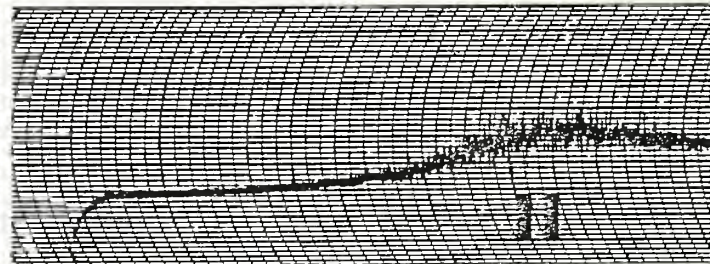
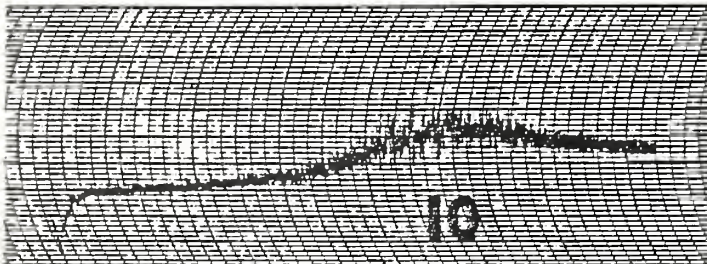
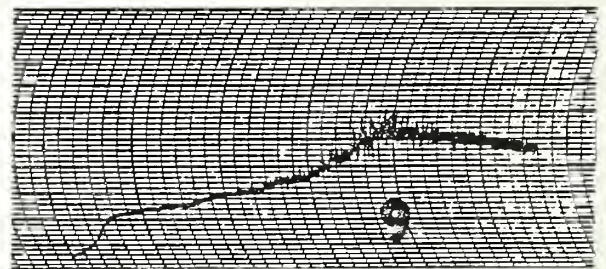
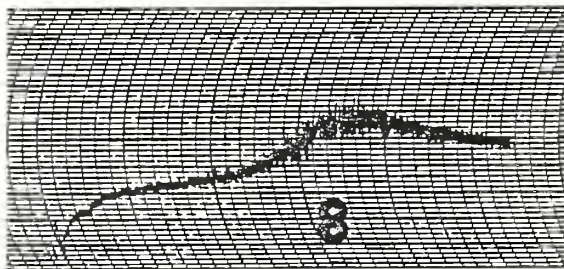
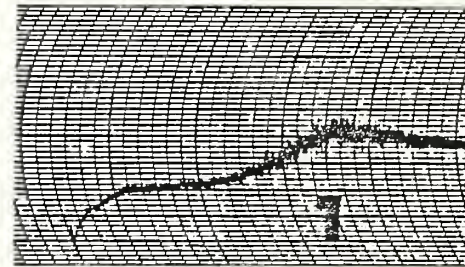
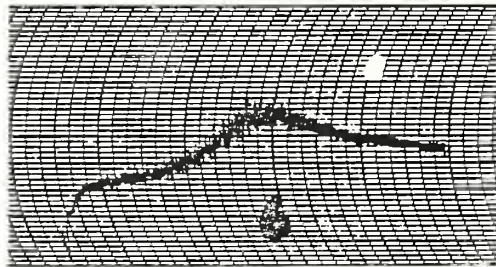
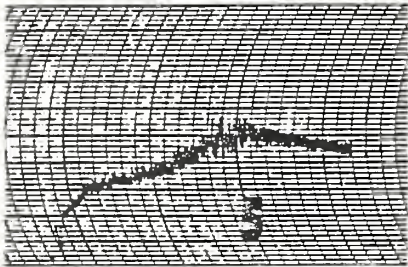
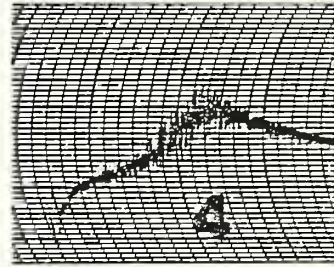
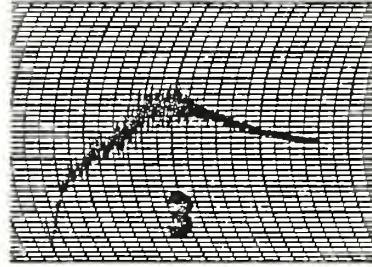
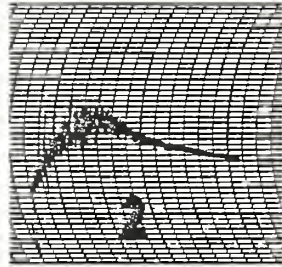
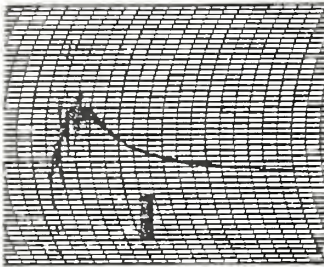
XXX.09 = OPEN. XXX.10 = IRREGULAR. XXX.30 = SLIGHTLY OPEN, IRREGULAR. XXX.50 = SLIGHTLY IRREGULAR, OPEN. XXX.70 = SLIGHTLY OPEN.

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9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.

REFERENCE MIXOGRAMS

HARD RED SPRING WHEAT



U.S.D.A. SPRING WHEAT QUALITY LABORATORY

FARGO, NORTH DAKOTA



